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ALL ABOUT EDUCATION

will be contained in our Educational Number, to be published on Saturday, September 6. It will deal with pharmacy schools and examinations, and with the curricula and qualifications in medicine, dentistry, veterinary surgery, and science. We want all those interested to send us prospectuses or similar information. As the number will be specially circulated to colleges and hospitals it will give manufacturers, agents, and wholesalers an excellent opportunity of calling attention to goods required or used by colleges and hospitals

Summary.

KING EDWARD VII. was crowned on August 9.

PARTICULARS of the wills of five deceased chemists are given on p. 322.

A CURIOUS TRANSACTION in electric-light installation is noted on p. 319.

THE AWARDS in connection with the King's sanatorium are given on p. 260.

A GLASGOW CHEMIST is doing good business in sterilised humanised milk (p. 265).

DR. ATTFIELD recovered a sum of 69l. 5s. for dilapidations from a tenant of his at Finchley (p. 319).

A DENTIST qualified in Austria-Hungary is not entitled to registration in this country (p. 318).

MR. T. H. W. IDRIS is the new President of the British Pharmaceutical Conference (pp. 274 and 317).

A PHOTOGRAPH of Lady Godiva, the feature of the Coventry Coronation festivities, is given on p. 262.

THE IMPERIAL VACCINATION LEAGUE would like to have re-vaccination at school age made compulsory (p. 262).

OUR JAPANESE CORRESPONDENT reports several shipments of iodine and preparations to Europe and Asia (p. 326).

THE supplementary list of subscribers to the Drug-trade Appeal Fund is given on p. 322. The amount collected is over 533l.

SOME PAPERS of PHARMACEUTICAL INTEREST are to be read at the Congress of the Royal Institute of Public Health (p. 260).

THERE is some talk of planting indigo in Natal, and no doubt Indian planters will be glad to sell the necessary seed (p. 265).

"XRAYSER'S" topics this week are distilled water, the Pharmacy Act cases of last week, and the international scientific catalogue (p. 267).

DR. B. H. PAUL has resigned the editorial position on the *Pharmaceutical Journal* which he has held for thirty-two years (page 321).

WE give particulars of the career of Mr. John Robbins, who died last Friday. His scientific work concerned ozone and peroxide of hydrogen (p. 322).

SIR JAMES CRICHTON BROWNE waxed eloquent on the subject of flies when speaking at the annual meeting of the Sanitary Inspectors' Association (p. 263).

INTERESTING particulars in regard to the charge against Mr. Fleming, who shipped pure borax to the United States as "washing-crystals," will be found on p. 266.

THE FINE PORTRAIT of GEORGE WASHINGTON which Mr. Henry S. Wellcome has presented to the Grand Lodge of Freemasons was unveiled last week (p. 261).

PHARMACIST DANVAL, the ex-convict, having been released from his confinement, has arrived at Paris, and has received an ovation from the pharmacy students there (p. 266).

THE SALFORD ANALYST has found 20 gr. of salicylic acid in 1 gal. of wine (p. 263), and a grocer has been fined for selling orange-wine containing 15 gr. in 1 pint (p. 319).

THE INCOME OF THE ROYAL COLLEGE OF SURGEONS shows a handsome balance on the credit side, whilst that of the Royal Botanic Society is insufficient to meet the expenses (p. 260).

A DRUG-MERCHANT was charged at the Mansion House Police Court on Wednesday with having 740 lbs. of saccharine in his possession on which duty had not been paid. Two warehousemen answered a similar charge at Southwark (p. 318).

THE feature of the markets this week is the excitement in opium, and morphine is dearer in sympathy. Pilocarpine is lower. Soda tart. and pulv. seidlitz have advanced. Saffron is firmer, and quinine in second-hands is also a shade firmer, but very quiet (p. 323).

THE BRITISH PHARMACEUTICAL CONFERENCE held at Dundee this year has been a decided success both from a social and scientific point of view. We publish abstracts of the papers read on pp. 269 to 273, a report of the proceedings on pp. 275 to 317, and other items concerning the doings on p. 273.

A PLEASING FEATURE of the Conference proceedings was the presentation to Mr. W. A. H. Naylor, who for sixteen years filled the office of Honorary Secretary. A writing-desk, three pictures, and illuminated list of subscribers was the form the memento took. We give the latest portrait of Mr. Naylor on p. 315.

English News.

Local newspapers containing marked items of news interesting to the trade are always welcomed by the Editor.

Brevities.

It is proposed to hold an international exhibition at Manchester in May, 1903.

Ivor Edward Pengelley, described as a chemist, of Plumstead, pleaded guilty to being drunk at Woolwich on August 4, and was ordered to pay 7s. 6d., the doctor's fee.

The memorial bust of the late Mr. W. Martindale, by Mr. F. M. Taubman, has been placed in the examination-hall of the Pharmaceutical Society's house, 17 Bloomsbury Square, W.C.

The income of the Royal College of Surgeons of England was 26,954l. for the year ending June 24, the income exceeding the expenditure by 3,056l. The investments of the College were increased by 3,000l.

Woodcock's Drug Company (Limited), 2 Magdalen Street, Norwich, which we alluded to as the North Heigham Drug Company last week, has not, we are informed, been sold. Both the house and shop and the business are still for sale.

A committee of the Selborne Society is being formed to purchase the house in which Gilbert White lived at Selborne. A sum of between 8,000l. and 9,000l. is required, and it is proposed to use the house as a memorial of the father of British naturalists.

The Army, Navy, and Civil Service Co-operative Society of South Africa has, in consequence of the action brought by the Army and Navy Co-operative Society, agreed to alter its title to the Naval, Military, and Civil Service Co-operative Society of South Africa.

The Barton Regis Board of Guardians on August 8 decided to act on the recommendation of the Local Government Board that the Board should in future supply the drugs and medicines needed by the medical officers, instead of the latter finding them out of their salary.

At the meeting of the Council of the Metropolitan Hospital Sunday Fund on August 5 it was announced that the amount collected this year was 57,800l., as compared with 45,063l. last year—an increase of 12,737l. The amount is to be distributed among 147 hospitals and 55 dispensaries.

At Cokermonth Police Court on August 4, Mr. Walter Stanley Scott, chemist and druggist, of Cokermonth, was summoned at the instance of the Urban District Council for failing to provide a suitable cover for a manure-receptacle at a stable in accordance with the by-laws. The case was adjourned for a fortnight to enable Mr. Scott to comply with the by-laws.

From Westminster.

There is nothing to report of the doings of Parliament for the last two days of the Session beyond the fact that the Licensing Bill received Royal assent on August 8. Both Houses adjourned till October 16 for the holidays.

The King's Sanatorium.

According to the *Lancet*, 180 essays were sent in to the Advisory Committee appointed by the King in connection with the erection of a sanatorium for tuberculosis. The committee, which consists of Sir William Broadbent, Sir R. Douglas Powell, Sir Felix Semon, Sir Herman Weber, and Dr. Theodore Williams, recommend the following for prizes, subject to the approval of his Majesty:—

First prize, value 500l.—Motto, "Give him air; he'll straight be well."—Dr. Arthur Latham (London), with whom is associated as architect Mr. William West (London).

Second prize, value 200l.—Motto, "If preventable, why not prevented?"—Dr. F. J. Wethered (London), with whom are associated as architects Messrs. Law & Allen (London).

Third prize, value 100l.—Motto, "*Vis medicatrix naturæ*."—Dr. E. C. Morland (Croydon), with whom is associated as architect Mr. G. Morland (Croydon).

The following four essays, being judged by the Advisory Committee to be of "great excellence," are awarded honourable mention:—

Motto, "*Fac recte, nil time*."—Dr. P. S. Hichens (Northampton), with whom is associated as architect Mr. R. W. Schultz (London).

Motto, "Open air everywhere."—Dr. Turban (Davos), with whom is associated as architect Herr J. Gros (Zürich).

Motto, "*Honestam quam magnam*."—Dr. Jane Walker (London), with whom are associated as architects Messrs. Smith & Brewer (London).

Motto, "*Humus*."—Dr. J. P. Wills (Bexhill), with whom is associated as architect Mr. Wills (London).

Institute of Chemistry.

It is announced that the final examination for the Associateship of the Institute in the branch of biological chemistry will be held on October 21 and the three following days. The examination is in biological chemistry, with special reference to the chemistry and bacteriology of foods, waters, sewage, and effluents, and the practical applications of biological chemistry to industries. The examination is open to any candidate whose application for admission has been accepted by the Council, and to any person who has passed the Intermediate examination. Tuesday, September 23, is the last day for candidates to notify the Registrar of intention to be present.

Royal Institute of Public Health.

Several questions of pharmaceutical interest are to be dealt with at the annual congress of the Royal Institute of Public Health, to be held at Exeter from August 13 to 20. The President of the Congress is the Earl of Idlesleigh. Professor Sims Woodhead will preside over the section dealing with chemistry, &c., and the papers to be read include the following: "A Standard for Drugs," by Mr. H. Wippell Gadd, Exeter; and "The Prevalence of Poisoning by Carbonic Oxide," by Dr. J. C. McWalter. In the section dealing with Municipal and Parliamentary Hygiene Mr. Glyn-Jones will open a discussion on the "Schedule for the Sale of Poisons," and the papers to be read will include "The Relationship of Commercial Aids to the Work of the Medical Profession," by Mr. A. Searle. A programme of receptions and excursions has been arranged.

Royal Botanic Society.

The sixty-third annual meeting of the Royal Botanic Society of London was held on August 11 in the museum at the Society's gardens, Regent's Park, Mr. C. Brinsley Marlay presiding. The report presented by the Council stated that the number of Fellows has increased, and now stands at 2,136, whilst the School of Practical Gardening continues to prosper. Not only has there been an increase in the number of students, but the amount received as fees for instruction during the past year was considerably larger than usual. The School Committee has decided to build and equip a laboratory, and the Technical Education Board of the London County Council has voted a grant which will lessen the cost to the Society. Free orders of admission for study had been granted to all *bona-fide* students of botany and art from more than twenty London schools and colleges. The financial statement showed that the expenditure exceeded the receipts by 76l. 9s. The Chairman said that while the receipts last year only amounted to 4,348l., the income in 1885 was 6,487l., and suggested that the question of raising the subscription should be considered. Sir John Hutton supported the proposal to raise the subscription, but Sir Edwin Galsworthy suggested that an appeal to the Fellows for funds should be made.

The Victoria University.

The question of the proposed disruption of the Victoria University will be tried before a committee of the Privy Council in November. The inquiry is to be conducted mainly by affidavits and the speeches of counsel, though witnesses may be called and examined. The Yorkshire College is taking the lead in the defence of the University, and Mr. Cripps, K.C., M.P., is to represent the College and the Leeds Corporation. Liverpool is to be represented by Mr. Alfred Lyttelton, K.C., M.P.

Washington Worship.

On August 8 Mr. Choate, the American Ambassador, unveiled the portrait of George Washington recently presented to the Grand Lodge of Freemasons of England by Mr. Henry S. Wellcome. The ceremony took place in the library of the Freemasons' Hall, Great Queen Street, W.C. The Earl of Warwick (Deputy Grand Master) opened the proceedings by a speech of welcome to the American Ambassador. He said that Coronation time was an appropriate one for holding a ceremony of that kind, as it indicated the cordial feeling which existed between England and America. Any bitter feelings which might have been engendered by the War of Independence have long since been obliterated by time. Lord Warwick mentioned that during the war Washington maintained to the fullest extent Masonic and brotherly feelings towards members of the Craft. On several occasions when Masonic treasures and implements were taken by the Americans from the English force they were returned with all possible compliments by Washington to the generals of the armies fighting against him. The Bible upon which Washington took his oath when initiated into Masonry is still in the possession of the 46th Regiment.

Mr. Choate then unveiled the portrait, an engraving of which is shown here. The portrait by Robert Gordon Hardie,



an American artist, represents Washington in the Court dress of his period, wearing the full regalia of a Freemason. Mr. Choate, in the course of an eloquent speech, mentioned that Lord Rosebery has a noble portrait of Washington by Stuart in his possession, so that now there are at least two excellent portraits of the Father of his Country in London. Everybody knew the great part Washington took in establishing the independence of his country, and how that had resulted indirectly, but none the less surely, in securing free government in all lands which the Anglo-Saxon race had occupied. The leading traits of his character which made him the soldier, the statesman, and the patriot that he was, were familiar to all. His conscientious devotion to what he believed to be his duty, his unflinching sacrifice of all else to that, his stainless virtue and purity, his unerring intelligence and wisdom, the ardour and intensity of his patriotism, whether fighting for King and country against

French and Indiaus in the first flush of his manhood, or leading the united colonies on their hard road to independence at all hazards, or, as the first President of the young nation, working out the success of the new Government, ought to be known to every schoolboy. His fortitude in defeat, his forbearance and self-control in the hour of victory, his inexhaustible patience, and the well-rounded and well-balanced completeness of his faculties needed not to be rehearsed there. To crown all, there was that charm and virtue, so rare in great masters of men, the unaffected modesty and simplicity of his nature which marked his whole career. In all the wonderful events of the nineteenth century, in all the great crises through which the nation which Washington founded had passed, among all the illustrious men whom events had called forth to preserve and transmit the blessings which he fought and laboured to secure, not one had eclipsed or overshadowed him. As the country had grown his fame had grown with it, and to-day, after three generations completed, he still stood the first of Americans in the hearts of a grateful people. It was particularly interesting on an occasion like this to note the good will and the constant regard and estimation with which his memory had been treated by the writers and people of England. The manner in which he conducted the contest with the Mother Country commanded their respect, which seemed to have ripened into reverence and affection as the years had rolled on. The *Times* of January, 1800, a few days after the news of his death reached England, contained this felicitous tribute: "Having displayed in his own person the rare combination of talents at once military and pacific that would do honour to the first general and the first statesman of any age or country, and having evinced in private life the most unblemished probity and the most endearing manners, he has also enjoyed the most exclusive happiness of dying in full possession of his reputation and glory." He congratulated the Grand Lodge of England on thus accepting George Washington as one of their patron saints, and trusted that his memory might be cherished in England, as in America, to the end of time. (Loud cheers.)

Mr. Passmore Edwards proposed a vote of thanks to Mr. Choate, which was seconded by Mr. Henry S. Wellcome. Mr. Wellcome gave some particulars of the portrait, mentioning that the artist had obtained a portrait of the features from the most authentic sources, whilst the regalia depicted is from the actual Masonic clothing which Washington wore, and which is still in existence.

Birmingham Notes.

Handsworth tradesmen have been visited by the inspector of weights and measures. Out of fifty shops only three had defective weights.

Marriage has claimed yet another lady dispenser in Miss DeVall, who with her sister was married at Christ Church, Summerfield, on July 30.

Mrs. Percy Frankland (Professor Frankland's wife) has been elected a Vice-President of the Scottish Association for the Promotion of Women's Public Work.

Generally speaking, Coronation Day was not observed as a Bank Holiday in Birmingham. The chemists closed by arrangement at 2 p.m. for the rest of the day. Decorations were few. Mr. Foden, of King's Heath, had a display of fairy coloured lamps with night-lights burning.

The local feature during the holidays has been the flower and fruit shows. They are of immense interest to the young pharmacist as aids to the study of botany, and should be attended, if possible, for that purpose. The King's Heath pharmacists were admitted to the magnificent grounds and glass-houses of the Right Hon. Joseph Chamberlain at the *fête* last Tuesday.

There should be no excuse for the milkman not knowing the new conditions imposed by Parliament, and coming into force on September 1, regarding the milk standard, for the facts have been well posted throughout urban districts. It may be expected that pharmacists will have inquiries made of them, concerning the analysis of milks, by those interested.

Our city not only claims Dr. William Palmer Wynne, F.R.S., for his scholastic training, but also for his training in pharmacy, for he was articled to Messrs. Southall & Co., Bull

Street, to learn the mystery and art of analysis and pharmacy. He was cotemporary with Mr. W. B. Featherstone, F.C.S., and Mr. H. W. Jones, F.I.C., the latter of whom is now, and has been for many years, chemist and director of the laboratories of Messrs. Wyleys & Co., Coventry.

It is hoped that Birmingham is well represented at the Dundee Conference, but the awkwardness of the date made it difficult for those in high places, pharmaceutically, to arrange for delegates to be there to represent the local brotherhood. It is stated that the President is not now a member of the Conference, and that a quorum could not easily be found. London members were specially favoured in being able to go by boat, for the sportsmen hurrying to the moors made travelling by rail less convenient than usual.

The Vaccination Question.

The Imperial Vaccination League, which has for its object the promotion of the study of the laws regulating vaccination and the consideration of possible improvements in the present law and its administration, has begun its campaign. An appeal is made in the *Times* for funds. The league do not oppose the conscientious-objector clause of the 1898 Vaccination Act, but think the clause should be worked in strict conformity with the spirit and letter of the law. The league consider that re-vaccination at school age should be obligatory, and that the entire supply of glycerinated calf-lymph should be guaranteed and regulated by some public authority.

Coronation Festivities.

The celebrations at Coventry included a grand historical procession, the central figure of which was, of course, Lady Godiva, the part being played by a lady from the London Hippodrome. A procession of some 20,000 school-children also formed a feature of the festivities, in the arrangements for which Councillor F. Bird, chemist, took a leading part. We reproduce a photograph of the "Lady Godiva" procession passing Mr. Bird's pharmacy in Spon Street. The pageant,



our readers will notice, is historically accurate only as far as the procession itself is concerned, there being no prohibition, as in the original, against onlookers; for we observe Mr. Bird himself at the first-floor window playing the part of "Peeping Tom," as well as other spectators.

On Coronation Day the students of the Leeds College of Pharmacy had a botanical excursion to East Keswick. Over one hundred specimens were described. A feature of the walk was the hearty rendering of the National Anthem at the time of the ceremony. Dinner was served at the Altior

Hotel. A cricket-match followed, and after tea the party walked home, returning in time to enter with gusto into the spirit of the festivities which were proceeding.

Wine and Spirit Licences.

At a Special Transfer Session held at the St. Helens Town Hall on Monday, the wine-licence in Liverpool Road was transferred from a chemist's manager named Rayner to Mr. Martin Remers.

The wine-and-spirit licence of 146 High Street, Southampton, has been transferred from the names of Messrs. William Brodribb Randall and Harry Wilson to that of Harry Wilson.

Blackpool Chemists' Association.

On Coronation Day the Secretary (Mr. Sankey) of the Blackpool and Fylde Chemists' Association sent a telegram to Buckingham Palace expressing the Association's humble and sincere loyalty to the King, and Mr. Sankey received a reply on Monday from the King's Secretary thanking the chemists for their loyal congratulations and good wishes.

The Lady from Chesham.

Several Blackpool chemists have received letters from a lady at Chesham, Bucks, ordering medicines which in some cases—it may be that it is only a coincidence—have been followed by demands from Somerset House for penalties for not stamping. "Malt and cod-liver oil" and "neuralgia-mixture," not in themselves liable to stamp-duty, were in two instances rendered liable through showcards which held out these articles to be good for certain complaints. It will be well for chemists: to overhaul not only their labels but their showcards.

Fires.

The pharmacy of Mr. Fraser, Douglas, Isle of Man, was on August 6 the scene of an outbreak of fire, caused through the ignition of some methylated spirit. Fortunately the Fire-brigade managed to confine the flames to the cellar, but damage to the extent of 50*l.* was done.

At 4.45 A.M. on August 11, smoke was observed issuing from a fanlight at the shop of Mr. Martin Johnson, chemist 104 Fore Street, Devonport, and it was found that a store-room at the back of the shop was on fire. On entering the store-room a gas-jet was seen alight near a wood shelf, on which was a quantity of cotton-wool, which had caught fire. The partition separating the store-room from the shop had also become ignited, and the fire had reached the shelves around the shop. The fire was quickly extinguished. No one was on the premises at the time of the outbreak, as Mr. Johnson and his family were staying on the Moors. An assistant was in the shop on Sunday evening, and apparently forgot to turn off the gas before leaving. The damage, which is not great, is covered by insurance.

Death of a Chemist.

At the Southwark Coroner's Court on August 11, Mr. F. Danford Thomas, the Deputy-Coroner, held an inquiry with reference to the death of Mr. George Bell, a registered chemist, who died suddenly last Friday at 130 Tooley Street, S.E. The widow stated that for eighteen months the deceased had had no business of his own, but had been acting as manager for a City firm. It was not a regular situation. He used to drink a great deal, and was in the habit of doctoring himself to get over the effects. Being a chemist, he knew the medicines and drugs and their uses. Deceased came in late on August 7, and went to bed, but got up very early in the morning, saying he was going to get some brandy. She heard him go into their son's room adjoining, and then there was a thud, and, going to the room, she saw him on the floor. Not being able to rouse him, she sent for Dr. Schimm; but, on his arrival, he said that the deceased was dead. The Coroner: He had not taken anything, had he? Witness: No; there was nothing to take. The Coroner: I mean a drug? Witness: No. Dr. Jeremiah Schimm, of 39 Dockhead, S.E., stated that he was called on Friday morning, and found the deceased dead. He had since made a *post-mortem* examination, and found that the organs showed extensive signs of alcoholic excess and pneumonia. Death was due to syncope, following

excessive drinking. There was no evidence that the deceased had recently taken any drug or medicine.

The jury returned a verdict of death from natural causes.

The Plague of Flies.

Sir James Crichton Browne presided at the annual conference of the Sanitary Inspectors' Association at Middlesbrough on August 6, and took for the text of his presidential address the part played by mosquitoes and flies in disease. After tracing the history of the discovery of the agency of *Anopheles* mosquitoes in malaria, he referred to the *Musca domestica*, or common house-fly, and dwelt at some length on the subject of its iniquities. Until lately looked upon as a harmless creature, the crushing of which on the window-pane had been held to indicate juvenile depravity, the fly was now regarded as a pathogenic enemy that ought to be put under a sanitary embargo. The fly's proboscis was not, like that of the mosquito, a tube for the injection of poison, but, said Sir James, from personal observation he knew that the fly's body was the means of conveying much objectionable matter from place to place, and, considering its varied diet and liability to bacterial infection, its excremental deposits might at times be highly detrimental. In its flight from, say, the galled place on the horse's back to any abraded surface on the human skin, it had been known to convey and sow seeds of septicæmia. The fly attaches himself to man, and multiplies prodigiously in his vicinity. It had been said that in South Africa the flies were nothing extraordinary until the British army arrived, when the large quantity of refuse and dead horses upon which they could feed and multiply caused large numbers to appear. They seemed to be particularly attracted to enteric patients, it having often been possible on entering a hospital-tent to tell the enteric patients at a glance by the swarms of flies on and about them; and the fly had undoubtedly much to do with the spread of that disease both in South Africa and at home. It had been observed out there that typhoid rapidly diminished on the appearance of frost, and, as everyone knows, flies breed very slowly in cold weather. The fly-plague was always markedly diminished whenever punctilious care in the prompt removal of refuse was adopted, and the liberal use of "Tanglefoot" (which, as Sir James humorously observed, was an American fly-paper, and not Cape whisky) was strongly recommended. The fly served no useful purpose, except, perhaps, as a signal to sanitary inspectors that their services were required; while it was a vexatious pest in a highly nervous age. One female fly might have 25,000,000 descendants in the course of a season. He strongly advocated the use of wire-gauze protectors for meat, &c., which should always be stored as far as possible from dustbins and other sources of contamination. Medical science, concluded the President, was on the alert, and able to overcome obstacles which not long ago appeared insurmountable, and science encouraged the hope that other maladies still obscure—even the inscrutable cancer itself—would be explained, as malaria had been, and made amenable to prevention and treatment.

A Chemical Company Fined.

At Brownhills on August 13, the Brownhills Chemical Company, of Lichfield Road, were summoned for failing to carry out the provisions of the Factory Act. The inspector pointed out that in such manufactures employers were required to provide respirators charged with moist oxide of iron. On visiting defendants' works he found that sulphuretted-hydrogen gas was generated, and he thereupon warned the firm that the Act must be strictly complied with. On visiting the works some months afterwards he found that the respirators, not being charged with moist oxide of iron, were useless. Consequently, the lives of the workpeople were endangered. The company pleaded guilty, saying the irregularities were due to the negligence of a foreman. The firm had since, however, complied with the terms of the Act. A fine of 20s. and costs was imposed.

The Dispensing at the Portsmouth Hospital.

At a meeting of the Management Committee of the Royal Portsmouth and Gosport Hospital recently, Alderman T. Scott Foster, J.P., called attention to the dispensing-department, which was not, in his opinion, economically worked. The dispenser was an unqualified man, receiving 75% a year

and rations. He dispensed medicine, but did not make tinctures and infusions. A considerable saving (he thought quite 50% a year) might be effected if they engaged a qualified man. A letter was received from Dr. Ward Cousins asking that 150% should be allowed for medical and surgical appliances for the honorary medical staff, and it was referred to the Drug Committee, who also were asked to consider the position of the dispenser, and to bring up a recommendation.

Trade Outings.

The annual outing of the employes of Messrs. F. Darton & Co., Clerkenwell Optical Works, London, took place on July 26. Going by train to Tilbury, the party proceeded to Margate by steamer, where dinner was served at the Crown Hotel. Mr. Darton, who presided, replied to the toast of "The Firm," and said that in spite of the bad conditions of trade generally the progress made in the past year showed that the firm still maintained its high position. After dinner the party went for a drive, and returned to London by steamer. The weather was fine and the outing thoroughly enjoyed.

Analysts' Reports.

In a private sample of ginger-wine analysed by Mr. J. Carter Bell, public analyst for Salford during the quarter, he found 20 gr. of salicylic acid to the gallon. The matter was reported to the Borough Council at their last meeting.

Mr. Chas. Estcourt, Manchester city analyst, analysed 543 samples during the quarter, only sixteen of which were adulterated. The preserves, syrups, and sweets were free from arsenic, six samples of beer practically free from arsenic, and three samples contained minute traces of the poison not exceeding $\frac{1}{550}$ gr. per gal., probably due to the process of malting. Five samples of preserved peas contained respectively 2.4, 1.2, 0.74, 0.67, and 0.42 gr. of copper sulphate per lb.

Mr. Charles E. Cassal, public analyst of the borough of Kensington, in the course of his quarterly report, issues a warning against the use of formaldehyde as a "food-preservative." This preparation is, Mr. Cassal says, a poison, and even in very dilute solutions renders the food treated with it incapable of digestion. In connection with a specimen of milk of sulphur found to contain nearly 50 per cent. of sulphate of lime, he states that the extensive sale of this or of any other material containing sulphate of lime is most objectionable, inasmuch as the ingestion of such a preparation may be highly injurious and even dangerous.

A Poorly-paid Doctor.

Dr. H. J. Flanagan, Poor-law medical officer of Northampton, in making an application recently for an increase of salary, stated that for 70% a year he had paid 900 visits, held 250 consultations, and supplied 4,500 6-oz. bottles of medicine. This works out at a fraction under 3d. for each visit, consultation, and bottle of medicine combined. The Board of Guardians on August 5 increased his salary to 95% a year.

Cricket.

Wellcome C.C. v. Davy Hill C.C., played at Brockley on August 9, resulted in a victory for the Wellcome C.C. The scores were: Davy Hill C.C., 52; Wellcome C.C., 114.

The Week's Poisonings.

The poisoning-cases reported since last record number twelve, of which six are accidental and six suicidal.—Two cases of chloroform-poisoning are reported. In one the operation of trephining was being performed on a patient at Ipswich, who died from the effects of the anæsthetic. The doctor was absolved from all blame. In the other case, Dr. Jas. Deakin, F.R.C.S., Sale, who had been in the habit of inhaling chloroform to induce sleep, took too much, and was found dead in his bed.—Two instructive cases of mistaking bottles reach us from Bampton. In one of these a Dr. Down took up a bottle in the dark containing what he thought was lemonade, but which proved to be nux vomica. Prompt attention, however, saved him. The other case is that of a labourer who, being unable to read, took some liniment containing ammonia in place of a medicine for internal use. He is on the way to recovery.—At Warminster, a certain Jabez Adams visited the churchyard where his wife was buried,

decorated the grave with flowers, and drank an ounce of prussic acid. He followed the profession of veterinary surgeon, which perhaps accounts for his having the drug in his possession.—Laudanum is responsible for two deaths. In one a mother gave 6 drops of laudanum as a soothing draught to a 6-days-old child; in the other, a young man at Lincoln drank threepennyworth of laudanum without any apparent reason. He had been in the habit of frightening his mother by pretending to take laudanum, which had always turned out to be cold tea. This time, however, it was tincture of opium, and he died. The chemist who sold it to him after asking him why he wanted it, and being told it was for rubbing, said jocularly, "I hope you are not going to poison yourself," and deceased laughed and said he was not tired of life yet.—A woman at Stamford Hill poisoned herself by taking oxalic acid, and another woman at Nottingham made an end of herself by swallowing aconite liniment.—At Hull, one Frederick Stamford, described as dispensing-chemist to the Friendly Society's Medical Institute, but whose name does not appear in the register, died from accidentally taking an overdose of chloral. Deceased had been suffering from pericarditis, and had taken a small dose, which, however, in his case was too large.—At Southampton, an inquest has been held on the death of Richard Patchett, described as a retired chemist, aged 34, who had taken ten soloids of corrosive sublimate. Mustard and raw eggs had been administered, but without avail, and a verdict of suicide was returned.—The inquest at Wolverhampton on the death of Alice Sargent, reported in our issue of August 2, has been resumed, and one of the witnesses, Thomas Harper, was censured by the Coroner for neglecting the deceased, who had really died of pneumonia, from which she had been suffering before taking the poison; she ought to have been removed to hospital in time.—Only one case of carbolic-acid poisoning is reported. It comes from Bristol. A man named Alfred Dudden was found in his bedroom on August 11 suffering apparently from a fit. Medical aid was sought, but it was found that the man had died of carbolic-acid poisoning. A bottle which had contained the poison and an egg-cup were found beside him.

Irish News.

Local newspapers containing marked items of news interesting to the trade are always welcomed by the Editor.

A Case of Gas.

Professor Tichborne gave a lecture at Cork to the meeting of gas managers in conference there on carburated water-gas.

Pharmacy Gives Thanks.

The service in St. Patrick's Cathedral, Dublin, on Coronation Day was attended by representatives of the Council of the Pharmaceutical Society of Ireland.

Personal.

The many friends of Mr. Samuel Turkington, member of the Irish Council, will hear with regret that he has been laid aside by serious illness for the past three months. He is still very weak, and unable to attend to business.

The honour of knighthood was on August 11 conferred by the Lord Lieutenant at a court held at Dublin Castle on Mr. Thos. Myles, ex-President of the Royal College of Surgeons in Ireland, and Professor Whitla, M.D., Queen's College, Belfast.

Up-to-date Side-lines.

Many pharmacists and druggists in Belfast have become agents or call-offices for the Telephone Company, which invariably brings customers, and enables them to have the service for themselves at a cheap rate. This is now being improved upon by the same parties acting as offices for the receiving of advertisements for one of the evening papers published in the city.

Business Changes.

Mr. C. H. Nesbett, L.P.S.I., 152 York Street, Belfast, has removed to more extensive premises on the same side of the street—No. 166 York Street.

Mr. A. W. W. Agnew, M.P.S.I., Carlisle Circus Apothecaries' Hall, has completed extensive alterations to his pharmacy. The windows have been fitted with air-tight cases, and the shop and stores are lighted by electricity.

Want Some Profit.

At the first annual Conference of the Irish Traders held last week in Cork, Alderman Ireland (who presided) said in the course of his address that there were already forty local branches of the Society in existence, and all were doing splendidly. It was resolved unanimously that the time had come when the stocking of proprietary articles not yielding a minimum of at least 15 per cent profit should be discouraged as the sale of such articles at a less profit proved detrimental to manufacturer, retailer, and consumer alike.

Apothecaries' Hall, Ireland.

At the annual meeting of the General Council of the Apothecaries' Hall, Ireland, convened by the Act of Incorporation, 1791, on August 1, the following were duly elected to hold office for the ensuing year ending July 31, 1903: Governor, Dr. George A. Stritch; Deputy-Governor, Dr. Arthur Atock; Directors, Mr. Hugh A. Auchinleck, Mr. John Evans, Dr. Thomas D. Finucane, Dr. Edward Hanrahan, Mr. Michael F. McNamara, Mr. Robert Montgomery, Dr. Robert John Montgomery, Mr. Richard G. O'Flaherty, Mr. James Raverty, Mr. James Shaw, Mr. Joseph Ryan, Professor C. R. C. Tichborne; Representative on the General Medical Council, Professor C. R. C. Tichborne; Secretary, Mr. Robert Montgomery.

Addresses to Lord Cadogan.

Among the addresses offered to Lord Cadogan on his retirement was one from the Royal Dublin Society, presented by the Vice-President, Lord Powerscourt, in the absence of the President. The address said that twenty-five years ago the Royal Dublin Society had ceased to be responsible for the administration of the Parliamentary grants for science and art in Ireland, and during his Excellency's viceroyalty a further Act of the Legislature transferred these institutions to an Irish department. The Society had increased its usefulness by creating new opportunities for advancing the objects which it was incorporated to promote. Lord Cadogan, in replying, expressed his great regard for the Royal Dublin Society. He also received, and suitably acknowledged, an address from the Royal College of Surgeons in Ireland.

Will not Apologise.

At the last meeting of the Rathdrum Guardians a letter was read from the Governors of the Apothecaries' Hall, Dublin, the medicine-contractors, calling attention to statements made with regard to some medicines supplied to Dungarstown dispensary, and condemned by the analysts. They stated that one of the drugs was not supplied by them, and the other, too, could not represent any of the drugs supplied that quarter as explained by the medical officer. In the circumstances, they should respectfully and emphatically refuse to take back the two drugs or make any allowance for same. They had observed that a very damaging report had appeared in the public Press to the detriment of their house, and they should ask the Guardians for an apology, to which they could give the same publicity. The Chairman (Mr. Dougan): Well, Mr. Byrne, will you make an apology? Mr. Byrne (guardian): I will take no notice of the letter. The Clerk: I am afraid apologies are not in Mr. Byrne's line. However, I think you could soften the matter down a bit. They are in the right with regard to the length of time the drugs were in the dispensary, and they are not responsible (and the Local Government Board wrote to that effect) for the condition of the medicines when they were not supplied within the last quarter. Mr. Byrne said he would use no "soft sawder" with them at all. The Chairman said the Board did not censure the contractors, and that no apology was needed. The Board was not responsible for the indiscretion of individuals. No action was taken in the matter, the Clerk explaining that Dr. Byrne should not have sent samples for analysis that were lying on the shelves for more than three months.

Scotch News.

Local newspapers containing marked items of news interesting to the trade are always welcomed by the Editor.

The Kinnimont Medal.

The Kinnimont Gold Medal has this year been awarded for the sixth consecutive time to a student of the Glasgow School of Pharmacy—Miss Annie M. Barr, Kempeck Street, Gourrock.

Death of a Fife Policeman.

In the Auchterderran district a good deal of excitement has been created by the finding of the body of William Aitken, police constable, in a wood. It appears that he left his home on Sunday night, and as he did not put in an appearance at the office on Monday a search was made, and his body found in Craig's Wood. A bottle containing carbolic acid lay beside him. A medical man stated that death was due to carbolic-acid poisoning. Deceased had been in a despondent state for several days, and had made a remark to the effect that life was not worth living.

Glasgow Notes.

Some of the wholesale houses were closed on Coronation Day, but the great majority of retail shops remained open, and on the latter the decorations were conspicuous by their absence.

The question of the employment of unqualified dispensers in public institutions in Glasgow and its neighbourhood is to be dealt with in a practical way at next election time for parish councils, &c.

The project for a Glasgow Pharmacy Athletic Club still hangs fire, but, as a preparation for it, many assistants are taking to early morning golf and rowing, and a few, who want to begin cautiously, are trying a 'prentice hand at that distinctively old-man's game, bowls.

What might have been a literally devastating spill was narrowly averted on a Glasgow street last week. A tramcar ran into a lorry loaded with carboys of vitriol. Fortunately only one of the carboys fell and broke on to the street. A boy who had been riding on the lorry was so badly burned with the spilled vitriol that he had to receive medical treatment.

The Trade Association, having organised Glasgow and the West of Scotland, has sent its agent to work over the Southern counties as far as the Border. Representatives of the Association attended the annual meeting of the Federation of Local Pharmaceutical Associations at Dundee to give information about the principles and propaganda of the Glasgow movement.

An enterprising suburban chemist is developing a good business for the sale of sterilised artificial human milk. He mixes cow's milk, cream, sacch. lactis, and water in the proper proportions, and pasteurises the mixture. His customers order so much per day. The children reared on this preparation thrive famously. The chemist, who makes no secret of his method, suggests it to his fellow-craftsmen as a new and profitable side-line.

A chemist lately got a medical man's prescription to dispense which contained acid. sulph. dil. and mist. cretæ. Naturally inferring that this was an inadvertence on the doctor's part, the dispenser sent a diplomatic message to him. It was churlishly received, however, the reply being that the dispenser might have known that the decomposition was intended. The mixture was accordingly compounded as prescribed, and the patient had the benefit of the calcium sulphate.

The pre-Reformation hospitals of Glasgow form the subject of an interesting series of papers in course of publication by a local antiquary. The meaning of the term "hospital" has been specialised in recent times. Originally, as is well known, it was the generic term for almost any benevolent institution. Of old-time hospitals, in the modern sense of the word, two of the most interesting were that for

the treatment of venereal diseases, on a site not far from the present Royal Infirmary, and the Leper House or Hospital on St. Ninian's Croft, to the south-east of the existing Stockwell Bridge. Traces of the latter institution survived until the beginning of the nineteenth century.

A raw apprentice has just had an overwhelming adventure. He was reaching on tip-toe for a gallon bottle of syrup of squill from the top shelf, when it toppled over, struck the edge of the shelf, and broke, pouring its contents upon the hapless wight. But the mischief did not end here. The heavy bottom of the bottle hit a gallon percolator containing tr. hyoscyami, and syrup and percolate streamed over the floor. When the principal, alarmed by the terrific crash, rushed into the back shop, his righteous indignation at the destruction of his property had to yield to pity for the "disgruntled" apprentice, who was sent home to get a bath and reflect on the instability of all human affairs.

A contributor, who is represented to be a doctor, writes in a weekly newspaper giving an account of various cunning devices for drinking secretly in public in Glasgow. It turns out that most of the contrivances are old friends. Of such are the brandy-filled *bonbonnières*, the whisky-flask in the heart of the bouquet of flowers, the alcohol-bottle disguised as a dainty smelling-salts "contraption," and that hollow mockery the tubular fan. The writer seems to be ignorant of the most remarkable invention of this order, which consists of a "pocket pistol" having the external appearance of a go-to-meeting Bible. It used to be advertised in an American journal, and was specially recommended to church-going Scotch-Americans.

South African News.

(From our Correspondents.)

MASONIC.—Mr. J. E. Jones, chemist and druggist, Mafeking, was elected S.W. of the Austral Lodge, 2534, E.C., on July 14.

SCHWEPES AT THE CAPE.—It is stated (says the *Mineral-water Trade Review*) that Schweppes (Limited) propose to establish one or more factories in South Africa.

THE DRUG AND CHEMICAL IMPORTS into the Orange River Colony for the first quarter of 1902 amounted in value to 13,729*l.*, against 3,445*l.* for the first quarter of 1901. The imports of similar products into Cape Colony and the Transvaal were given in last week's *C. & D.*

DYNAMITE IN SOUTH AFRICA.—The Chamber of Mines at Johannesburg, on July 26, favoured by a majority the imposition of a coast-duty of 7*s.* 6*d.* per case on dynamite, to protect local factories. A strong minority desired free trade. The annual consumption is 300,000 cases.

NEW CHEMISTS.—The following gentlemen have been licensed to practise in Cape Colony in the capacity of chemists and druggists: George William Allen, chemist and druggist, Great Britain, October, 1895; Harry Evans, chemist and druggist, Great Britain, April, 1887; Henry Searle Mitchell, chemist and druggist, Great Britain, October, 1894.

SEED FOR INDIGO-PLANTERS.—In the *Natal Mercury* of July 4 it is stated that a possible new industry of considerable interest is in front of Natal. Mr. A. M. Baily, accredited by the Government of India, and also by the indigo-planters in that country, is at present in the colony making inquiries in regard to the indigenous indigo-plants of Natal, with a view to obtaining a large supply of indigo-seed for the use of Indian planters. It is probable that some hundreds of tons of the seed will be required every year. It is suggested that this would be a valuable crop to grow in Natal, for seed purposes if for no other. The yield of seed for plants growing 6 feet apart is stated to be about 1 lb. per plant, or 1,210 lbs. per acre. The present price for the seed is 1*s.* 6*d.* per lb.

THE alcohol exhibition which is to be held at Lima is to be opened on January 1, 1903.

French News.

(From our Paris Correspondent)

STUDENT'S ATTEMPT AT SUICIDE.—A pharmacy student, named Champlot, 20 years of age, who failed recently at his examinations, attempted to commit suicide at Lyons when he learnt the result. He went to the Guillotière cemetery, and shot himself with a revolver beside his father's grave. He was found with three letters held crised in his left hand, and from their contents it transpired that he sought to put an end to his life rather than bear the mortification of meeting the friends who were supporting him, after his want of success. The unfortunate young man is not expected to recover.

DR. GARNAUT'S EXPERIMENTS continue to occupy a good deal of attention in Paris. The *Figaro* has published an interview with Professor Koch by its Berlin correspondent, regarding Dr. Garnaut's experiments of self-inoculation with bovine tuberculosis, in which the German scientist is stated to have declared that the experiments carried out by Dr. Garnaut are not conclusive, either in the manner in which they were performed or the results that have been obtained from them. The French doctor is indignant at this reported statement of Herr Koch. On the other hand an interview has been published with Dr. Nocard, of the Pasteur Institute, Paris, who is a leading authority on the subject of tuberculosis. He is reported to have said that he does not attach a shred of value to Dr. Garnaut's experiment, though he believes the inoculation is possible.

THE EX-CONVICT PHARMACIST DANVAL arrived at Marseilles last Monday, August 11, by the mail steamer *Australian*, together with his wife and three children. On landing Danval was received by MM. Baudin and Laribe, the President and Vice-President of the Association of French Pharmacy Students, and M. Serment, President of the Marseilles Pharmacists' Syndicate. Danval left early on Tuesday morning for Paris, but his family remained at Marseilles, owing to the illness of one of his children. Several hundred dockers assembled on the quay at the moment of landing and loudly cheered the ex-pharmacist. He was escorted to an hotel by ten policemen, with a considerable group of his admirers in the rear. It will be remembered that the ex-pharmacist was sentenced twenty-two years ago to hard labour for life on the charge of poisoning his first wife with arsenic; the trial was a sensational one, but the evidence was largely circumstantial. Certain unfavourable facts, however, that came to light regarding Danval's private life undoubtedly had a good deal to do with the sentence. Danval arrived at the Gare de Lyon, Paris, at 5.15 on Tuesday afternoon, August 12, and a large number of students of pharmacy and medicine assembled at the railway-station and organised a demonstration in his favour. Amongst the crowd were delegates from the Paris Association of Pharmacy Students, the members of the committee which had been instrumental in obtaining Danval's release, and from the various Paris Students' Associations. When the train drew up at the platform the cheering began. As Danval did not at once appear the students practically took the train by storm, to the dismay of the passengers, and a rough scrimmage followed. Found at last, the ex-pharmacist was caught in a whirlwind of enthusiastic admirers, and it was with great difficulty that the three gentlemen who had accompanied him from Marseilles managed to find him again. They were M. Jacques Dhur, of the *Journal*, who was principally instrumental in obtaining the pardon, and MM. Baudin and Laribe, of the Pharmacy Students' Association. Carriages were in attendance, and after a little difficulty the party drove off at a gallop, but the carriages were soon stopped by the crowd. Danval stood up in his carriage, evidently much affected, and bowed. Then his admirers shouted, "Vive Danval! Justice! Justice!" The ex-pharmacist effusively shook hands with a large number of people, and the procession of carriages went by way of the Grands Boulevards to the offices of the *Journal*, in the rue Richelieu. Soon after arriving at the rue Richelieu, Danval appeared at a window of the first floor of the offices of the *Journal*, and was enthusiastically cheered by the crowd. He is to be the guest of M. Jacques Dhur for the present.

Colonial and Foreign News.

PROPOSED PATENT-MEDICINE REGULATION IN SWEDEN.—A committee appointed by the Swedish Pharmaceutical Society has drawn up proposed regulations regarding the sale of patent medicines. The German, Norwegian, and Danish regulations have been taken as models. It is proposed that the sale of secret remedies (the composition of which is entirely or partially unknown), poisons, all compounded medicines, &c., should be restricted to pharmacies only. These proposed regulations are to be submitted to the general meeting of the Pharmaceutical Society, when the question of establishing a scale of salaries for assistants will also be considered.

INTERNATIONAL EXPOSITION AT ATHENS.—An international exposition of industry, commerce, art, and hygiene is to be held in Athens, beginning October 15, 1902. The general classification will include, *inter alia*, alimentation, manufactured products of all kinds, hygiene, medical arts, industrial manufactures, chemical products, photography, scientific objects, agricultural products, &c. The price of exhibition-sites is fixed at 100f. persquare meter (1,196 square yards). Packages destined for the exposition are exempt from all Customs duty and Octroi. Applications are to be addressed to the Executive Committee, Royal International Exposition of Athens.

VIENNESE CHEMISTS' CO-OPERATIVE SOCIETY.—A co-operative society, composed of several pharmacists, has been formed in Vienna, under the style of "First Pharmaceutical Co-operative Society, Vienna." The directors are Messrs. Emil Fridrich, director of the Austrian Pharmaceutical Society, Vienna; Johann Harna, Court pharmacist, Kremsier; and Anton Schmidt, Vienna. Dr. Hans Heger, the Editor of the *Pharmaceutische Post*, is one of the ten members of the board of management. The object of the Society is the manufacture of surgical dressings and appliances, pharmaceutical and chemical preparations, &c., and their sale to members. The articles manufactured may, however, be sold to non-members by permission of the director, and any qualified pharmacist may become a member of the Society; also those engaged in allied trades. The Society has acquired the Turinsky-Grossmann factory at Vienna, the direction of which is entrusted to the former proprietor, Mr. Hans Turinsky.

BORAX IMPORTED AS SODA.—As already mentioned in the *C. & D.*, the case against Mr. Ernest L. Fleming, the English dealer in borax and washing crystals, has been dismissed after several adjourned hearings before Commissioner Alexander at the New York Court. The charge was that of defrauding the Government, by importing as washing-crystals, at 25 per cent. *ad valorem*, materials which were practically pure borax, and therefore subject to a duty of 5c. per lb. There still remains the question of forfeiting the shipments which were seized, and this part of the case will go to the General Appraisers if Mr. Fleming makes a demand for the goods. In the course of the hearing Mr. Fleming was called to give evidence on his own behalf. He stated that he deliberately prepared the mixtures of borax and soda, with a view to testing the Customs law of the United States, hoping to find a profitable market. The United States Vice-Consul at Liverpool had told him he could ship borax and soda as washing crystals, and they would be entered at 25 per cent. *ad val.* He advised him to make a shipment as a test, and let the appraisers in New York fix the valuation. He made several shipments of pure borax, invoiced and marked washing-crystals, to his brother, Mr. W. H. Fleming, a cement-dealer. These consignments were assessed at $\frac{2}{3}$ c. per lb., but the authorities claimed that 5c. per lb. should have been paid. The prosecution, however, had no testimony to offer on the subject of criminal intent, so Commissioner Alexander announced that he would dismiss the case. He said that in his opinion the defendant acted in an open and straightforward manner, going to the United States officers and asking them about the shipments, afterward endeavouring to comply with the law as it was told to him. It was said that Mr. Fleming's importations are not likely to continue, as the tax will be not less than 3c., and perhaps 5c. per lb., which would make the business unprofitable.

Observations and Reflections.

BY XRAYSER.

Distilled Water

is not exactly a burning topic just now, but it is sufficiently prominent to deserve some attention. I have seen no protest against the resolution of the wholesale druggists to charge in future a modest 3*d.* per gal. for distilled water instead of giving it free as heretofore. From such comments as I have heard, their decision is rather welcomed than resented by their customers. Not that anyone ever feared lest the wholesale druggists would give away too much. Those gentlemen can at least be trusted to take care of themselves. But it is considered better to pay for each thing we have and not to take gifts in business. Was not that the gist of the old proverb about fearing the Greeks when they came carrying gifts? Moreover, we can complain with a better grace if the quality is not up to standard if we have paid a fair price for an article. Lastly, as a friend reminds me, the 3*d.* is only apparently gone. We shall be poor buyers, he says, if we cannot recover it by giving the screw another little turn when the travellers call.

But it is a Serious Question

whether we should not ourselves distil the water we use instead of buying or accepting any from the wholesalers; and certainly it is beyond doubt that we should assure ourselves of its genuine origin, and should then take all reasonable precautions to keep it pharmaceutically clean. Read Mr. C. E. Sage's letter in last week's *C. & D.* (page 248) on this subject. He tells us that the results of some of his bacteriological examinations of distilled water have been terrible, but he never published them because he knew that no good could result so long as distilled water was prepared, handled, and dealt with under the old conditions. Mr. Sage's excuse for not publishing what he had observed is rather weak. It is difficult to see why the exposure might not have borne good fruit a year ago as well as now. To the conscientious pharmacist the quality of his distilled water will always be a matter of the first importance, and a good many, I should think, will consider what satisfactory arrangement they can make for distilling on their own premises. In the *C. & D.* report of the Medical Exhibition at Manchester lately a brief reference occurred to a still made by a well-known firm which costs 8*s.* 6*d.*, and which would deliver 5 or 6 gals. a day. The still-licence of 10*s.* must not be forgotten, but it will be money well spent if an absolutely pure water can be relied upon. In many localities, too, I should think, neighbouring chemists would be only too glad to buy their distilled water from their friend with the still.

The Pharmacy Act Case at Sheffield

has brought into prominence a remarkable difference of opinion between analysts all specially experienced in testing drugs. Mr. Tickle found morphine in a certain mixture which had been bought from an unqualified vendor; Mr. A. H. Allen and two well-qualified assistants said the indications which Mr. Tickle thought proved the presence of morphine were really better evidence of the alkaloids of ipecacuanha. This is a vital point in Pharmacy Act evidence which will have to be fought out to a finish. But the legal aspect of the case in question is also a little interesting. The Judge refused to decide whether morphine was in the mixture or not, but the evidence, he said "undoubtedly showed that the shop was kept open for the retailing and compounding of poisons." This seems a

strong statement to make so long as the morphine question was unsettled. The defendant's case was that he did not retail or compound poison. When asked for laudanum and paregoric he gave ipecacuanha. If this was so it might be an offence under another Act, but could hardly be one under the Pharmacy Act.

More Curious Still

was the Pharmacy Act case tried at Wolverhampton. In this the police prosecuted a drug-store man for having sold a poison, he not being a registered chemist and druggist, and also with having kept open shop for the sale of poisons. Both of the iniquities alleged are infringements of the 15th section of the Pharmacy Act, and under this section only the Registrar of the Pharmaceutical Society can sue for the penalties provided. He, too, must sue for such infringements (in England and Wales) in a county court, not prosecute in a police court. There was nothing in the charge which entitled the police to bring the defendant into a police court, and the Stipendiary Magistrate ought to have known this. It would have created a pretty dilemma if he had convicted.

Mr. James Reid

writes a suggestive letter, but he does not exactly meet my challenge. His allegation was that "the old lot" "had never really known the difficulties under which pharmacy is carried on in the vast majority of cases"; and an inference followed that if they had known it they could have remedied the unsatisfactory condition. Now, I understand that the allegation is that our leaders failed to perceive, when stores began, the new character which the chemist's business was to take—more trade and less scientific. But suppose they had clearly foreseen this, what should they have done? Mr. Reid's argument suggests that they should have abandoned either the whole or part of the scientific subjects comprised in the education and examination of newcomers into pharmacy, and teach them instead the art of pushing. I can hardly think that Mr. Reid would accept this, put baldly in my simple language, as a correct representation of his creed, but I do not think it is an unfair abstract of his profession of faith.

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Editorial Comments.

The Crowning of the King.

THE Coronation of King Edward VII. and his Consort Queen Alexandra, which was postponed from June 26 owing to the lamentable illness of the King, took place on Saturday, August 9, in Westminster Abbey. His Majesty looked hale and hearty, and his progress through the streets was marked by continuous cheering from the crowds of people who lined the route. The historic ceremony, which was witnessed by a congregation of several thousand persons, passed off successfully, and the moment of crowning was made known to the outer world by the salutes fired from the Tower and in Hyde Park. That his Majesty's reign may be long and prosperous is our earnest wish, and with our readers in all parts of the British Empire we unite in the cry—

"GOD SAVE THE KING."

The Conference at Dundee.

IF there is a second youth in the lives of corporate bodies, that is now the happy condition of the British Pharmaceutical Conference—assuming for the nonce that it is a corporate body. This is the fourth year in succession that it has revisited a town which welcomed it while it was still a very young body, and it is arranged that Bristol, the scene of the eleventh meeting, will welcome the members again in 1903, on the occasion of the fortieth reunion. Birmingham was the first town to re-welcome the Conference. It had met there in 1865, and in 1886 Mr. Thomas Greenish presided at the second meeting in the capital of the Midlands. The other duplicates in the list are—

Bath	1864 and 1888
Nottingham	1866 " 1893
Dundee	1867 " 1902
Liverpool	1870 " 1896
Edinburgh	1871 " 1892
London	1874 " 1900
Bristol	1875 " 1903
Glasgow	1876 " 1897
Plymouth	1877 " 1899
Dublin	1878 " 1901

Towns which have been visited once are Norwich (1868), Exeter (1869), Brighton (1872), Bradford (1873), Sheffield (1879), Swansea (1880), York (1881), Southampton (1882), Southport (1883), Hastings (1884), Aberdeen (1885), Manchester (1887), Newcastle-on-Tyne (1889), Leeds (1890), Cardiff (1891), Oxford (1894), Bournemouth (1895), and Belfast (1898). During its thirty-nine years' existence the

Conference has had twenty-five Presidents—all Englishmen except one Scotsman (Mr. J. B. Stephenson, 1885); but Mr. E. C. C. Stanford was President in 1892 on account of his Scotch residence, and Mr. J. C. C. Payne in 1899 because he was a Belfast man. Of the twenty-five, only four have been Presidents of the Pharmaceutical Society of Great Britain—Messrs. Henry Deane (the first President), John Williams, Thomas Greenish, and W. Martindale. Fourteen of the twenty-five have been provincial pharmacists, and only one wholesale druggist (Mr. Charles Umney) has occupied the chair, besides two manufacturing chemists (Messrs. Williams and Stanford). Professors Bentley, Redwood, and Atfield and Mr. Holmes have represented the academic side of our calling. It thus appears that eighteen of the twenty-five Presidents have been retail pharmacists, and it is immensely to the credit of the Conference and to British pharmacy that the counter rather than the counting-house and laboratory has supplied the guidance (apart from the Secretaries) for an institution whose work has consisted chiefly in advancing practical pharmacy and sustaining fraternal relations between its votaries.

The Second Dundee Meeting

was inaugurated on Monday evening by a civic reception, given in the Victoria Art Galleries, by the Lord Provost and Mrs. Hunter. This function, as will be gathered from the full report on page 275, marked a new departure in Conference proceedings, the civic welcome relieving Tuesday to the extent of half an hour. On that day Principal J. Yule Mackay, M.D. (a member of the General Medical Council), welcomed the members at the University College. The President's address followed, but we may mention here that the Treasurer's report showed an income of 658*l.* 11*s.* 4*d.*, as compared with 530*l.* 6*s.* 2*d.* last year, and expenditure 652*l.* 11*s.* 8*d.*, compared with 530*l.* 6*s.* 2*d.* By the time

The Presidential Address

was commenced by Mr. Druce, about 200 persons were present, including a good sprinkling of ladies. Mr. Druce did not venture to read the whole of his address, which was an erudite exposition of the progress of Scottish botany, and, therefore, contained numerous lists of plant-names—as troublesome to enunciate as they are difficult for the ear to catch. "Mr. Druce knows Scottish flora better than any other Englishman," we remarked five years ago, and the address demonstrated the truth of the remark, and why the President has attained this peculiar knowledge. He commenced with a happy reference to Professor Bentley's address at Dundee in 1867, when it was shown how advantageous the study of systematic botany is to pharmacists, and Mr. Druce deplored that now Great Britain is falling behind her continental and transatlantic rivals in this useful branch of education. Dealing then with the progress of Scottish botany Mr. Druce started with Robert Sibbald's book on the "Natural History of Scotland" (1684), giving biographical notes of Sibbald, which, with those of other investigators mentioned, were characteristic of the address, although the dates of discoveries of recorded plants, and where they were found, were to the botanist the substantial part of the intellectual repast. Dr. John Lightfoot's "Flora Scotica" (1777) was the next important addition to Scottish botany; then came the work of Sir James E. Smith (1790–1814), whose local and other coadjutors were mentioned; but the records of all these men shrink into small bulk when compared with that of George Don, the Forfar nurseryman, and father of David Don, who became librarian to the Linnean Society. Nearly half of the address was devoted to George

Don, who was born in 1764, and in 1790 settled in Forfar as a nurseryman, although he was a watchmaker by trade. Don died in 1814, and in the comparatively short period of twenty-four years had amassed such a wealth of material with reference to Scottish botany that most experts doubted the value of his work. About twenty years ago Mr. Druce, while botanising in Forfarshire, dislocated his ankle, and the leisure thus enforced enabled him to examine Don's collection. It proved a valuable mine to him, and by his advocacy George Don became as well respected generally as he was by Gardiner, the Dundee umbrella-maker and botanist, who wrote the "Flora of Forfarshire." Mr. Druce's tribute to Don included a close analysis of his reputed and undoubted discoveries, and concluded with a critical examination thereof. He then dealt briefly with discoveries by other botanists up to the time of Gardiner, next referring to recent work giving a list of plants peculiar to Scotland, and concluded by speaking of the pleasures of field botany. Although Mr. Druce is not the first botanist to occupy the presidential chair of the Conference, he is the first who has seriously attempted to give an exposition of his favourite study, and he has done this with much felicity of expression and such a knowledge of his subject that the address delivered this week will stand as a record in this field of research.

The Papers Read to the Conference

now claim our attention. We print the whole of the twenty-six communicated. We take this opportunity of acknowledging the courtesy of the Secretaries in submitting to us the manuscripts as they were received, whereby the labour of reporting has been greatly facilitated. The papers are quite up to the average standard, and several are exceptionally good. In the following notes we give the gist of the papers and the discussions upon them, so that our readers may take the fuller reports at their leisure.

Stability of Standardised Preparations.

Some critical pharmacists have declared alkaloidal standardisation of galenical preparations to be a failure, because the preparations lose alkaloid, one way or another, on keeping. Messrs. Naylor and Huxtable have pondered what such critics say, and have put preparations to the test by keeping liquid extract, tincture, and compound tincture of cinchona, liquid extract of ipecacuanha, and liquid extract of nux vomica under retail-shop conditions for nine months. The result was that the only preparation which appreciably deteriorated was liquid extract of ipecacuanha, and the depreciation in this case was only from 2.1 per cent. of alkaloid to 1.98—*i.e.*, about a twentieth, and a negligible amount (p. 289). This was followed, before the discussion was taken, by a paper on the

Quality of Standardised Preparations.

Messrs. Farr and Wright, whose work helped to precipitate the views which led to the adoption of standardisation processes in the British Pharmacopœia, reported on the quality of present-time commercial tinctures of belladonna, cinchona (simple and compound), nux vomica, and opium, also ipecacuanha-wine. While their former work revealed wide variations in the alkaloidal strengths of all these preparations (some being five times stronger than others), now the preparations approximate well to the B.P. standards. The greatest sinner is compound tincture of cinchona, which occasionally is less than half the official alkaloidal strength, and ipecacuanha-wine comes next, although none of it was found less than 0.066 per cent.—the B.P. figure being 0.1 per cent. They also gave extractive and sp. gr. figures, a comparison of which with the alkaloidal results shows how misleading these empirical factors

may be (p. 290). The discussion on these two papers was lengthy, but was almost confined to ipecacuanha preparations. It was led off by Mr. Bird, who confirmed Naylor and Huxtable's observations, and Messrs. J. C. Umney, N. H. Martin, J. R. Hill, W. Mair, T. Maben, G. Coull, D.Sc., A. W. Gerrard, Chas. Kerr, B. H. Paul, Ph.D., and the President also spoke, Dr. Paul's advice regarding the advantages of pure emetine being well appreciated. Following this came a paper on

Aromatic Sulphuric Acid.

It is sometimes stated that this preparation does not contain sulphovinic acid. Dr. Leonard Dobbin has looked into the matter, and has done such work upon it that the contradictions of text-book authorities are set at rest. He has prepared barium sulphovinate from the acid, as much as 48 gr. being obtained from a 2-oz. sample more than a year old. He is continuing his study of the subject, with the view to ascertaining the rate at which sulphovinic acid is formed in the preparation (p. 292). Again the discussion added little to what the author said, but a characteristic letter from Dr. Attfield to Dr. Dobbin made an excellent comment on the whole subject. The only other paper taken before luncheon on Tuesday was on

Chinese Oil of Neroli.

A new perfume-oil, distilled from the fruit of *Citrus triptera*, grown in China, has been imported in small quantity into London, with the object of finding a market for it, and Messrs. J. C. Umney and C. T. Bennett have chemically examined the oil. In their paper they detail the fractionation-results, which, with other data, show the constituents to be limonene, camphene (probably), linalool, linalyl acetate (traces), methyl anthranilate, and a paraffin hydrocarbon. The figures which they give for the oil, on comparison with oils of neroli (Bigarade and Portugal) and petitgrain, show similarity, but there are marked differences, and none greater than the physical properties, especially the odour, which is like that of a mixture of neroli, lavender, and tarragon. Hence it cannot replace neroli, but may be used for its own sake (p. 293).

Resuming after luncheon, with an audience of about fifty, the first paper was on

Olive Oil.

A critical examination in the laboratory of the B.P. tests for olive oil, applied to hundreds of samples (chiefly those used in pharmacy), convinced Messrs. J. C. Umney and C. T. Bennett that the B.P. monograph should be revised. In their paper complete details were given regarding these factors—viz., sp. gr., solubility, acidity, iodine number, cottonseed-oil tests, sesame-oil tests, and tests for arachis (nut) oil. In a table they summarised the results for "virgin," "sublime," and "fine" olive oils, sesame oil, and cottonseed oil, and concluded by submitting a new text for the B.P. (p. 294). The discussion, in which Mr. Bird, Mr. Naylor, and others took a prominent part, gave emphasis to the fact that experts have sometimes to reject oils most probably genuine because the B.P. tests are faulty, and that, Mr. Tyrer said, is a serious matter, considering that the B.P. is taken as a standard.

Cannabis Indica.

On this drug pharmacist and pharmacologist had their say. Taking our kin first, Mr. Maben told, in an interesting way, how Mr. H. C. Hamilton, of Detroit, who tests the drug physiologically, has never been able to kill a dog with cannabis, and finds that there is considerable idiosyncrasy towards the drug on the part of the individual. The latter fact may account for the belief that some extracts are active and others not. Mr. Hamilton's experience of

cannabinol—an active principle, according to Wood, Spivey, and Easterfield—is that it is not so potent as the extract from which it is made (p. 296). Professor Marshall, following, gave an account of his pharmacological work on the principles isolated by Wood, Spivey, and Easterfield from charas, the peculiar resin of cannabis indica. He was clearly of opinion that cannabinol is the active principle, and stated that commercial cannabinols are only half the strength of that made by Wood and his colleagues. Professor Marshall has found that cannabinol readily oxidises into an inactive pitch, and this is most likely the reason why cannabis indica preparations become inactive on keeping. Mr. J. C. Umney was the only one who contributed to the discussion, his point being that acetone is not so effective a solvent of the principles of cannabis indica as is alcohol. Following this came a paper by Mr. J. F. Tocher on

Estimation of Urea and Uric Acid.

The nature of the reaction, which has not hitherto been understood, between uric acid and permanganate in acid solution, was first explained by Mr. J. F. Tocher. He showed that alloxan is formed during the titration of uric acid by Hopkins's method, and that that substance is acted upon by permanganate, producing the variability of results obtained by this method. He has further investigated the properties of alloxan, and shows that it reacts with ammonia in a manner similar to alloxantin. Alloxan, and not alloxantin, is shown to be the chief cause of the colouration caused by treating the urinary residue with strong nitric acid. The intermediate products of oxidation formed by boiling uric acid with acid permanganate are alloxan, alloxantin, and parabanic acid, and the final product is urea. As urea reduces permanganate considerably, the determination of uric acid by boiling with excess of permanganate cannot be carried out. The author shows that the figures given by Jolles are not attainable for this reason, and then he proceeds to describe his own method of determining uric acid by means of chromic anhydride, which quantitatively converts urates into urea. Two methods are given—(1) for urine low in urates, (2) for ordinary clinical work. Method No. 1 determines uric acid with great precision. After the urates have been precipitated as acid ammonium urate the precipitate is dissolved and treated with chromic acid. The urea formed is acted upon by hypobromite in a special reaction-flask, using potassium cyanate as recommended by Allen. The whole of the nitrogen present is evolved, and is measured in an ordinary gas-burette. Method No. 2 involves the construction of a special hypobromite-tube, into which the oxidised uric solution is placed, and the nitrogen evolved read off as uric acid per cent. of the sample used. This process is most suitable for clinical work, enabling operators to determine accurately both uric acid and urea in a few minutes. The author's hypobromite-tube will shortly be available, and should prove valuable to medical practitioners and pharmacists (p. 297).

The absence of several authors threw the rest of the proceedings on the shoulders of Mr. Edmund White, who read four of his five notes, all being appreciated owing to their practical nature. The discussions on them added no other facts.

Shaving-paste

is a novel subject for the Conference, and welcome too. Who has not tried to imitate Euxesis? Mr. White had not that so much in view as the need of his hospital surgeons for an aseptic paste to assist in shaving hairy parts before the knife is used, because when shaving-brushes are used they have afterwards to be sterilised, and that takes time. Mr. White told a few months ago how to make the

paste. We reprinted his formula, and were informed by correspondents that "it would not go." Mr. White has perfected it now. He heats together hard paraffin, suet, soft soap, and water; then adds tragacanth, glycerin, and perfume, as fully detailed on p. 299. Easy shaving results.

Compounding of Compressed Tablets.

Messrs. E. White and R. Robinson, jun., suggest a modification of a cocoa-excipient for compressed tablets, such as was described to the Conference at Liverpool by Mr. Stewart Hardwick. Their excipient is a mixture of 1 part of cocoa butter and 3 parts of powdered starch mixed when heated. One grain of this, added to 4 gr. of powder to be compressed, facilitates the operation wonderfully, the powder slipping through the machine without sticking, nor does it stick to the dies, while the tablet is sharp and hard, also disintegrating quickly in the stomach-contents. A white excipient is an immense advantage (p. 299).

Liquor Thyroidel.

Mr. White's note on this official preparation (which does not keep) was a concise description of how to make it satisfactory. Assuming that the gland contains 75 per cent. of water, he uses 15 c.c. of glycerin for every 20 grams of the gland-tissue, the procedure otherwise being as in the B.P. (p. 300).

Tasteless Cascara-sagrada Preparations.

Messrs. White and Robinson's fourth note was on debitterising liquid preparations of cascara sagrada. Their theory is that the bitter principle of this drug is an anhydride or a lactone which forms with ammonia, soda, or potash tasteless soluble compounds, but with lime and magnesia insoluble tasteless compounds which are filtered out owing to their insolubility. This suggestion accounts for the undoubted inactivity of most of the debitterised preparations. Messrs. White and Robinson adduced evidence of the purgative power of their preparations, and told how the latter may be made quickly and surely (p. 300).

The meeting was continued on Wednesday morning in delightful weather, and as a drive had been arranged for the ladies Mrs. Marshall was the only one of her sex who was present at the beginning, and she had come to hear her husband's communications. A melancholy duty fell to the President in noting the absence of one of the reporters, a gentleman who for many years has assisted this journal by his services, and on this occasion was acting for a contemporary. While he was working on Tuesday his eldest daughter was drowned in an unavailing effort to save her brother, and this calamity was not known to their father until his day's work was finished.

The Education of Pharmacists

was the subject of the first paper by Professor C. R. Marshall, who said there are three ways of instructing youths who enter the calling—first, by apprenticeship; second, by apprenticeship supplemented by coaching; and third, by collegiate training and shop training. For reasons which he stated he preferred the third course, one object being that those who undertake it may proceed to the B.Sc. degree without the qualifying suffix "Pharm." suggested by Mr. Tocher, so that pharmaceutical students should be exactly on a footing with other students of science. He advocated a collegiate course of two years, to include chemistry, physics, botany and zoology, pharmacy, materia medica, toxicology, and drug-analysis; this to be taken before the shop experience (p. 301). A lengthy discussion followed, the most notable feature of which was the declaration by the President of the Pharmaceutical Society that higher education for those who are to qualify under the Pharmacy

Act, 1868, has to be seriously considered, for the practice of pharmacy differs greatly in different towns. His own opinion was that the shop training must be taken before collegiate education, and that was the opinion of the majority of the speakers.

The Toxic Principles of the Coriariæ

was the subject of Professor Marshall's second paper. Besides giving useful information regarding this genus of plants, the Professor described Riban's coriamyrtin, and told how several coriariæ in New Zealand have poisoned many cattle and some human beings. Professor Easterfield has isolated from *Coriaria ruscifolia* a glucoside called tutin, which Professor Marshall has examined physiologically (p. 304).

Home-made Galenicals.

Mr. John H. Thomson, of Lochee, was the only local pharmacist who contributed to the Conference proceedings. His communication dealt with the manufacture of galenicals on the retail scale, and he showed by a large number of examples that many things, which are generally bought, can be produced economically and satisfactorily in the intervals of counter-business where apprentices are employed. He argued that this turns to practical account the technical skill and knowledge acquired in student days, and employs them to the best advantage; that it is a valuable means, and the only rational method, of training apprentices to perform those pharmaceutical operations which they must prove their familiarity with when they come before the Board of Examiners; and that it gives the individual pharmacist the satisfaction of supplying preparations which, to his personal knowledge, are free from adulteration and substitution (p. 305). The cost-prices which he gave did not include allowance for apparatus, skill, and time. It was suggested in the course of a lengthy and appreciative discussion that the prices were misleading and should not be published, because, said Mr. Martin, the Conference had never published a price-list before. Most of the speakers, however, including several wholesalers, pointed out that the purpose of the paper was to show retailers they would suffer no loss by making such preparations as would enable them to instruct their apprentices in the art of pharmacy. The prices can deceive no one, as they are not put in contrast with those of large manufacturers, to whom, in many cases, the cost of materials are a mere fraction of the cost of producing preparations.

Officialising Antidiphtheria Serum.

Mr. Thomas Maben, in a paper which contained interesting particulars of the success that has followed the antitoxin-serum treatment of diphtheria, advocated recognition of the remedy by the British Pharmacopœia, somewhat on the lines of the German *Arzneibuch*. This would necessitate, in his opinion, the establishment of a physiological and bacteriological laboratory under official control to which all manufacturers of serum would send their product for testing and bottling, and the certificate of that laboratory would be placed upon each dose of the serum so that the retailer and physician would see what they were dealing with (p. 308). Mr. Martin suggested that the subject was one for the General Medical Council and not the B.P.C. to decide.

Liquor Krameriaæ Conc., B.P.,

Was once described by a *C. & D.* contributor as an excellent coaguline. Mr. F. C. J. Bird is trying to make it a better medicine, as he thinks the formula capable of improvement. The changes are due to conversion of rhatania-tannic acid to insoluble rhatany-red on keeping, and to the fact that the liquor is at 60° F. a saturated solution precipitating at lower temperatures. Mr. Bird recorded in his paper a

series of experiments and observations, as a result of which he is able to say that if the B.P. menstruum is strengthened in alcohol to the extent of 5 per cent., or if 10 per cent. of glycerin is added to the present menstruum, the liquor keeps much better, and is altogether a superior preparation (p. 309). Nothing material was added in the discussion, and the members at this point adjourned for luncheon. On returning they were at once initiated into the mysteries of

Milk-Analysis.

Mr. G. D. Macdougald, the public analyst for Dundee, is a prolific inventor and excellent manipulator of the blow-pipe. He is also a firm believer in the necessity for analysts adapting their charges for milk-analysis to meet the rather shallow purses of dairy-farmers. These factors have incited Mr. Macdougald to produce a machine which enables an analyst to quickly and cheaply determine gravimetrically the percentage of fat in milk and the sp. gr. He described the apparatus to the Conference by means of diagrams, one of the best of which we reproduce on p. 310.

Bismuth Salts in Mixtures.

St. Thomas's Hospital laboratory sent five notes. The first, by Mr. Edmund White, dealt with the familiar fact that bismuth subnitrate and sodium bicarbonate in aqueous mixture interact with liberation of carbonic-acid gas. The mixture clots with gums. Mr. White had little new to say about improving such mixtures, but he submitted a formula for a nice glycerin of bismuth carbonate in which the freshly precipitated carbonate is mixed with glycerin. It contains 15 gr. of carbonate in 30 minims, and is as good for the skin as it is for the stomach (p. 311). Quite an interesting and general discussion followed on this paper, which helped to demonstrate that Scotch pharmacists are ever ready to discuss dispensing methods.

Bismuth Citrate and Liquor Bismuthi.

Mr. William Duncan, in a paper with the above title, elaborated the communication contributed to this journal of May 31 last, wherein he stated that bismuth citrate is really a dibasic acid, which forms soluble salts with alkalis. He now submitted proof of this in the form of barium, lithium, ammonium, sodium, and other salts of bismuthyl-citric acid (p. 312). The paper was read in lengthy abstract by Mr. J. R. Hill, but it seemed a trifle over-technical for the members, and they sought relief in

Willow and Poplar Barks.

There was something peculiarly fitting in the fact that the most important contribution to the chemistry of salicin we have had of recent years should have been made at Dundee, where five-and-twenty years ago salicin was reintroduced into therapeutics by Dr. T. J. MacLagan as a remedy for acute rheumatism. This week's paper was a communication from the Wellcome Chemical-research Laboratories by Dr. Jowett and Mr. Potter, B.Sc. In April, 1900, Dr. Jowett reported to the Chemical Society the discovery of a new glucoside—salinigrin—in a species of willow. This led to the examination of the bark of twelve American willows and poplars and nineteen European species. Salinigrin was found in only one (*Salix discolor*, Muhl., from Ithaca, N.Y.), and a separable amount of salicin from one also, although nine gave evidence of the existence of glucoside by an indirect method (hydrolysis and sugar estimation), five of these undoubtedly being salicin or populin. These meagre results led the authors to examine barks collected at different seasons (time of year being known to have an effect on the salicin-content). The results were remarkable, *Salix purpurea* bark from Cambridge giving only traces of salicin in July

22 per cent. in October and January, and 3.5 per cent. in April. Then they turned their attention to the sex of the trees, in order to see if that has anything to do with the salicin-content. Astonishing results were obtained; thus, *S. purpurea* bark from a male tree gave 1.2 per cent. salicin in April and 3.9 per cent. in July; and a female tree 3.5 and 0.2 per cent. in these months. The explanation of all this is that salicin is stored up in the tree to be used as food in the spring; the male trees use this up first in carrying out their functions up to production of pollen, and the female trees use up their salicin rapidly as soon as the stigmas receive the pollen. The slaughter of the innocents had now fairly set in, and the rest of the papers did not occupy five minutes. They were as subjoined:—

Dulcamara Principles.

Mr. Frederick Davis has done a useful piece of work by determining that dulcamara-fruit contains solanine, solanidine, solanein, and dulcamarin. He isolated the two alkaloids in a crystalline state, and described their characters, showing also that solanidine exists in the plant chiefly in the leaves and young shoots. He found commercial solanine to be a mixture of solanine and solanidine, which are distinguishable by a difference of 30° C. in their melting-points, solanine being 235° C. (insoluble in alcohol) and solanidine 205° C. (soluble in alcohol). They did not reduce Fehling's solution, although the text-books absurdly say of solanine "it is at once an alkaloid and a glucoside," and that solanidine is the result of the hydrolysis. On the other hand, Mr. Davis proved that solanein and dulcamarin are glucosides, the former splitting up on hydrolysis into the alkaloid solanidine, and glucose—a remarkable result (p. 313).

Volumetric Solutions.

In a brief note Messrs. Cowley and Catford showed that the error in working with decinormal and centinormal volumetric solutions (*e.g.*, those employed in titrating alkaloids) may amount to a difference of 3 per cent. on the quantity of alkaloid, if the solutions are measured with a burette. This they determined by weighing 10-c.c. and 4-c.c. quantities of soda and acid solutions, when lower amounts were invariably obtained, although allowance appears not to have been made for sp. gr. of the solutions (p. 314).

Bromidia Substitute.

The first of Mr. R. Wright's pharmacy notes was on liquor bromo-chloral comp., B.P.C., which he found not to be liked by medical men, who say it is too acrid, uncertain in its effects, and the dose is larger than the real thing. Mr. Wright suggests improvements, chief of which are replacing henbane-juice with hyoscyne hydrobromide and increasing the amount of liquorice. He submitted a formula on these lines (p. 314).

Camphorated Oil

was the next subject treated by Mr. Wright. The common enough defence in Sale of Food and Drugs Act cases that camphor is lost by heating was investigated, although it was to be expected that loss would be found; but Mr. Wright ascertained the percentages of loss by heating the liniment on the water-bath—to be a third of the amount of camphor taken. He explained that lin. camph. is quickly made by pouring the oil at 160° F. on the flowers of camphor and shaking. Chloroform (an entirely inadmissible addition) facilitates solution (p. 314).

Alcoholic Extracts

have certain advantages over watery extracts, especially those of aconite, belladonna, conium, colchicum, hyoscyamus, and stramonium. The Americans have realised

this, and Messrs. Farr and Wright proved it to the Pharmaceutical Society a few years ago. Mr. Wright returned to the subject with new figures obtained by making extracts with alcohols of different strengths, and he suggested that the B.P. authorities should look into the matter, pharmacists meanwhile studying it with the view to fixing standards. To help the latter Mr. Wright gave the alkaloidal standards of two American authorities (p. 314).

Estimation of Lead Salts.

The old B.P. method of estimating Goulard's solution and some other lead salts was to titrate with oxalic acid. That had its objections, which the substitution of standardised sulphuric acid for oxalic acid has not removed. Messrs. Cowley and Catford, returning to the old way, suggest precipitation of lead oxalate, collecting it and titrating (for oxalic radical) with standardised permanganate in presence of sulphuric acid. Their communication included a table of equivalents of lead and its salts for stated volumes of decinormal permanganate.

Titration of Sodium Phosphate and Arsenate.

Messrs. Dudderidge and Hill reported that the U.S.P. process of titrating phosphoric acid with alkali up to the formation of HNa_2PO_4 works well with phenolphthalein, which indicator is neutral to disodium hydrogen phosphate, a salt that is alkaline to methyl-orange. Taking advantage of the latter fact, and that NaH_2PO_4 is neutral to methyl-orange, they propose to estimate the purity of sodii phosphas B.P. (the disodium salt) by titrating with sulphuric acid, when the end-point is formation of NaH_2PO_4 , the next drop of standard acid producing the familiar pink solution. It is best to work with a strong solution of 3 grams sodium phosphate, and normal sulphuric acid. The authors showed by comparison with other methods that the process is accurate, and that sodium arsenate (Na_2HAsO_4) can be estimated similarly with equal accuracy and facility, but not ferrous phosphate or arsenate. Mr. Naylor said this was not new, as Mr. Hodgkin told about the test at the Cardiff meeting.

The Finale.

was long. First there was a well-deserved recognition of Mr. Naylor's services in the office of Secretary to the Conference, the presentation taking the form of several pictures in water-colours and a writing-desk, with a brief address on vellum bound in blue morocco. The speeches by the President and Messrs. Atkins and Martin (Past-Presidents) were a high tribute to Mr. Naylor's qualities as a man. Mr. Naylor acknowledged the gift in an eloquent speech. The formal business of thanks had a rare sincerity about it, for the meeting has been a signal success, and revealed an unexpected vitality that gives promise of greater things under the presidency of Mr. T. H. W. Idris at Bristol next year.

In the laboratory at the University College, Dundee, an exhibit of pictures, representing groups taken at the various Conferences, delighted many members. The photographs were especially worthy of note, seeing that many of the older members whose portraits were there shown have since passed beyond the bourne. About twenty photographs comprised the collection, and the laboratory was the resort of many eager sightseers. The photographs shown comprised those taken at Dundee (1867), Brighton (1872), Southport (1883), Aberdeen (1885), Manchester (1887), Newcastle (1889), Leeds (1890), Cardiff (1891), Edinburgh (1892), Nottingham (1893), Oxford (1894), Bournemouth (1895), Glasgow (1897), Belfast (1898), Plymouth (1899), London (1900), and Dublin (1901).

Conference Chat.

THE regal reception of Lord Provost and Mrs. Hunter on Monday evening appeared to afford much gratification to visitors and natives alike. The Lord Provost was frequently referred to as "no end of a swell" in his richly furred robes, and the ladies passed keenly critical, but mainly admiring, remarks on the Coronation gown of Mrs. Hunter. The fact which apparently impressed the visitors most was the circumstance that all the municipal dignitaries were there punctually on time, and stayed until the finish. One of them was a pharmacist—Baillie Doig, Vice-Chairman of the North British Branch.

* * * *

The local newspapers devoted considerable space to the proceedings. We have already quoted what the *Dundee*



AT THE RECEPTION.

—*Evening Post.*

Advertiser's lady reporter said about the dresses. It will be interesting to quote what the *Courier* lady said on the subject:—

Among the visitors were seen some beautiful toilettes. One of the handsomest was that worn by Mrs. Payne, Belfast—a black net robe, richly jetted, and made over white silk. Mrs. Umney, London, also wore a lovely gown. Made of white crêpe de chine, it was encrusted with rich *ecru* lace, dotted with jewels. On the bodice was worn a knot of pink roses. Mrs. F. Ransom, Hitchin, came in a charming gown of cream brillantine, the bodice having a vest of painted chiffon. Mrs. Martin, Newcastle, wore black lace over pearl-grey silk; and Miss Martin's pretty chine silk dress was trimmed with turquoise blue. Miss Downes, Bromley, was all in white, Mrs. Mair was in black with white, and Mrs. Jackson wore a gown of blue and white foulard; while Miss Jackson (Stirling) was daintily attired in tucked white silk.

Surely the pessimists can no longer hold that pharmacy is decadent.

* * * *

Mr. Druce wore his academical gown without the Arts hood during the Conference sessions.

* * * *

Mr. Alexander Govan, the Fifeshire pharmaceutical veteran, made an unexpected visit to the Conference on Tuesday forenoon, and the President of the Pharmaceutical Society gave him a place on the platform.

* * * *

The luncheons in the Queen's Hotel were slightly different in character from those usually in vogue at these meetings, inasmuch as the gathering was divided into a series of companies, the tables being distributed throughout two large rooms. This arrangement caused a congeries of parties, all more or less merry, and dispelled the formality usual with a large gathering in one big room. There was hot luncheon in one room and cold in another. It was arranged to reserve all toasts until Thursday, but the President on Tuesday pro-

posed the health of "Our Crowned King," which was accorded musical honours.

The fine weather ensured the happiness of those who went to Dundee more for sight-seeing than for science. On Tuesday morning, after the President's address, the ladies drove in char-a-bancs round the city, and the local Ladies' Committee gave their sisters an agreeable time. The party went by Perth Road and Blackness Avenue across the Balcay Hill to Lochee, and from there *via* Loons Road to Maryfield, at the extreme east end of the city, returning by Princes and High Street to Queen's Hotel in time to get places before the men at the luncheon-tables. In the afternoon they rested or shopped—many of them did the latter—until the train for St. Andrews was due.

The authors of the various papers were all warmly greeted on coming forward with their contributions, but special ovations were tendered to that veteran Conference-goer, Mr. Naylor (who appeared for the first time in many years in an unofficial capacity), and to Professor Marshall, while Mr. Tocher, whose educational enthusiasm has endeared him to Scottish pharmacists, was given a hearty greeting.

The Local Committee placed in the corridor of the University College big piles of Kidd's excellent guide to Dundee, and of the *Courier's* gossip guide to Dundee and district. This was a thoughtful attention that was much appreciated.

The trip to St. Andrews on Tuesday afternoon synchronised with the annual fair in the ancient city. Practically the whole of South Street was filled with booths and other frivolities common to fairs, and they overflowed into Market Street. The Town Council have tried in vain to get the venue of these impedimenta changed to neighbouring fields, but ancient usage has been too strong for them, so the Conference visitors did not see South Street at its best. It is a street bordered by trees, with colleges on one side, reminding one of Oxford. The visitors tapped all the sights as they went along to the cathedral ruins, which tell of a magnificent ecclesiastical pile unequalled by any in Scotland. Thence the pedestrians walked round to the Castle, where they saw the Bottle Dungeon, the remains of the room from which Cardinal Beaton watched the burning of Wishart (who was mercifully strangled by the Governor of the Castle before the faggots were lighted. Then they walked down the Scores, noting the palatial residences of some of the professors; after that they had a sumptuous tea, and had time for seeing more of the city before re-embarking on the train for Dundee at 9.30. The train made a record run of seventy minutes over the twelve miles track *via* Tayport and the Tay Bridge, and the travellers looked hungry when they reached the station.

At the Volunteer Drill-hall the members of the Conference were met by the Provost who in the name of the inhabitants of the ancient city gave them a very breezy and hearty welcome. He said they taught many things in St. Andrews—primarily "golf"—and he might mention that they had some good schools and a university, where other things of minor importance were inculcated. Speaking seriously, however, recent benefactions had enabled the University to enlarge its scope of work, and he hoped that in the future that institution would be instrumental in turning out some good chemists. He feared that St. Andrews offered little opportunity for the doctor and chemist, as the death-rate was only 10 per thousand; still, he greeted that Conference with the greatest goodwill, as the excellent work it was doing must have a beneficial effect upon all communities, and if the members would come to St. Andrews again as soon as he could wish, their absence would not be a long one.

That game of golf was reduced to a delightful contest between Mr. Edward Evans, jun., of Liverpool, Mr. James Anderson, of Dundee, and Mr. Sharp, of Musselburgh, who played all Wednesday on the Carnoustie links. Mr. Evans played Mr. Anderson, beating him 4 up with 3 to play. In the afternoon he played against the best ball of Messrs. Anderson and Sharp, and equalised.

To the agreeable astonishment of the Southroners whose ideas of the balminess of a northern summer are inclined to the sceptical, brilliant sunshine poured down on the gay costumes that graced the lawn in front of the University buildings on Wednesday afternoon at the close of the Conference proceedings. A large company assembled, were regaled with tea and cake, and had their photographs taken five times. The painstaking care of the photographer, and the artistic aid in colour-grouping given by Mr. James Russell (who appeared able to get the most dignified ladies to dispose themselves in the most pleasingly graceful attitudes with no apparent trouble), augur well for the pictorial success of the group.

The evening party in Gray's Rooms on Wednesday was a happy affair. The dance-programme seemed to be the only prearranged part of it, and it was exhilarating to look down from the ball-room gallery upon the gay throng, the ladies being charmingly gowned, and glittering diamonds gave the lie to the fancy that pharmacy is decadent. The breathing spaces between the dances were filled by music, and at the time this message was telegraphed Miss Anderson had sung entrancingly in the ball-room gallery, where also Miss Martin (Newcastle) played sweetly on the violin. The drawing-room was sacred to tea and ices. In the smoking-room Mr. Druce continued his presidential duties in his lightest vein, the concert there starting with a song by Mr. James Carmichael, who also sang well along with Mrs. Gray. Messrs. Anson and Silson, of Bradford, also sang, and the President called on Mr. Edward Evans to give a lecture on the "Gowf Stream," which prophesied an annual tournament as a Conference adjunct. Many others delighted the Conferees, and it was midnight before the last pestle-wielder left the artistic assembly rooms. The dance broke up at one. Mrs. Umney (London) and Miss Gibson (Edinburgh) sang beautifully, and Miss Kerr recited with marked histrionic ability. Thursday opened well, though dull, and nearly 300 started on the river-trip with every indication of an excellent day's enjoyment.

Mr. T. H. W. Idris, the newly-elected President of the Conference, is so well known to London pharmacists that one is apt to think everybody knows him equally well. He is a Monmouthshire man and, after an apprenticeship in his native county, went elsewhere to get fuller experience of the retail. Then he went to Herring's, in Aldersgate Street, in Mr. Charles Umney's time, and got an excellent insight into the wholesale trade. He had a short spell of business on his own account, but returned to Herring's within a year. After this he joined Mr. Peters in a retail pharmacy in Kentish Town, and there made the beginnings of the gigantic aerated-water business of which he is the head. Mr. Idris's long experience of County Council work is evidence of his administrative capacity. He is an excellent speaker and a generous man.



MR. T. H. W. IDRIS.

The Federation of Local Pharmaceutical Associations have promptly acted on the suggestion of "Xrayser" in last week's issue. On Wednesday a printed slip was distributed bearing the following message:—

IMPORTANT.

In view of the importance of the agenda it has been decided to throw open the meeting on Friday, August 15, at 9.45 A.M., in Room 31, Queen's Hotel, to all members of the Conference. Kindly note this and make arrangements to be present.

The business to be discussed includes the reservation of titles to registered persons only and the advisability of a test-case on that point; the incidence of the "Patent Medicine" law and its administration; and territorial representation as a basis for the election of the Pharmaceutical Council.

BRITISH PHARMACEUTICAL CONFERENCE.

THIRTY-NINTH ANNUAL MEETING.



DUNDEE: AUGUST 12 & 13, 1902.

AN international flavour distinguished the welcome which Lord Provost Hunter gave the members of the Conference and their lady friends to Dundee at the Victoria Art Galleries on August 11. It happens that the French frigate *Ibis* was lying in the Firth of Tay, and Captain Huguet, of that good ship, and his principal officers were amongst those who gathered in the Victorian Art Galleries on the Lord Provost's invitation. Amongst others whom we observed were Sir John Leng, M.P., Bailie Doig, D.L., M.P.S., and other local magistrates; Mr. Charles Kerr, Chairman of the Local Committee; Mr. A. B. Anderson, President of the Forfarshire Chemists' Association; Mr. G. T. W. Newsholme, President of the Pharmaceutical Society; Mr. J. C. C. Payne, Belfast; Mr. N. H. Martin, Newcastle-on-Tyne; Mr. W. F. Wells, Dublin; and practically all the local pharmacists, with an exceptionally good representation from other parts of the British Isles, most being accompanied by ladies whose dresses were industriously inspected by the fair reporters of the local papers, one of whom thus wrote about them:—

Mrs. Hunter had donned, in honour of the occasion, the beautiful gown which she wore on Saturday at the Coronation. I think this was a very pretty compliment indeed to the chemists and their friends, and I hope they were duly grateful. I am sure that Mrs. Hunter must have been well repaid for her kindly and graceful act by the very general admiration which the handsome toilette evoked among the feminine portion of her guests, at any rate. Mrs. Hunter Mitchell [adopted daughter of the Lord Provost] wore a salmon-pink toilette, trimmed about the bodice with black and silver passementerie. Lady Leng was wearing an elegant half-mourning toilette; Mrs. A. B. Anderson in black, with white vest and lace collar; Mrs. Charles Barrie in black and white; Mrs. Hodge in blue silk, trimmed with jet; Mrs. Charles Kerr, handsomely dressed in black, and her daughters, two in white silk, and Miss Kerr in a picturesque black-and-white dress, black velvet bolero, lace sleeves, and a chou of pale blue on the bodice. Mrs. William Chalmers was in white and blue, Mrs. Peter MacEwan in black, Miss Russell in black and white; Miss Hood in black over red, with a bouquet of pink roses; Mrs. John Cumming in an effective black-and-white toilette, with chou of pale green on bodice; Mrs. James Malloch in a tasteful black gown; Mrs.

Urquhart in a white-flowered silk dress, with lace on the pretty bodice; Mrs. James Gray in black and white; Mrs. John MacLachlan in black-checked grenadine over rose-colour, with damask roses on the bodice; Mrs. Rutherford in grey and white; Miss Downes in white silk; Mrs. John Turnbull in a dainty fresh white dress over lettuce green; Mrs. J. M. Hardie in black and pale blue; Miss Ferrier in a black silk skirt and white satin bodice, with glittering network of jet and silver; Mrs. Sharp in black and jet; Mrs. Doig in a beautiful white satin dress, trimmed with lace and chiffon; Mrs. Payne (Belfast) in a charming black-jetted robe over white silk, the bodice edged with folded tulle; Mrs. J. C. Umney (London) in white crêpe de chine, with motifs of the loveliest jewelled écarle guipure, and yellow roses; Mrs. Ransom (Hitchin) in a pretty white dress, with vest of painted chiffon; Mrs. Martin (Newcastle-on-Tyne) in blue and white foulard, and Miss Martin in black lace, with white silk. Mrs. Cumming came in a becoming black dress, with garniture of pink roses; Mrs. John Robertson wore a purple costume, and Mrs. Charles Kerr appeared in white satin, with chiffon frills and crystal passementerie on the bodice. Mrs. Braid wore black, relieved with mauve. Mrs. Jackson was in a blue-and-white foulard, and Miss Jackson in white; and Mrs. Jack was in black, with transparent lace sleeves.

The proceedings were novel in the Conference annals. Hitherto the Local Committees have been at the expense of the Monday evening receptions since Mr. F. Baden Benger, at Bath, showed how to fill up this dreary eve of waiting. This week Lord Provost Hunter (thanks to a happy luncheon with the Mayor of Oxford at Glasgow last year) took upon himself all the arrangements, and he did it thoroughly well. He had Mrs. Hunter with him in the dress which she wore at the Coronation ceremony on August 9. The Bailies of the city and their wives helped them to receive the guests, who wandered through the picture-galleries, hand-shaking, tea-drinking, and chatting, while a string band played in the concert-room. Shortly after 9 o'clock Bailie Doig, on behalf of the Lord Provost, made sure that all had had "something," and a few minutes later the Lord Provost, accompanied by Lady Leng, ascended the platform, with him being Sir John Leng and Mrs. Hunter, Mr. G. Claridge Druce, Mr. Charles Kerr, Mr. G. T. W. Newsholme, Mr. A. B. Anderson, Mr. James Russell, and others.

The LORD PROVOST, who was received with applause, said he considered it a very high honour to welcome the British Pharmaceutical Conference [he said "Society," as tradition has it] to Dundee. He did not remember the time, but he believed that the Conference met in Dundee thirty-five years ago. He understood the Conference was doing splendid work. One of its objects was to maintain uncompromisingly the principle of the purity of medicine. They must all acknowledge that that was a very important matter, not only for the Conference, but also for all the inhabitants of the country. (Applause.) His Lordship proceeded to deal with some of the more important changes that had taken place in Dundee since the last visit of the Conference, alluding specially in this connection to a decrease in the death-rate from 29.8 to 21.14 per cent., and the provision of infectious-diseases hospitals, public baths and washing-houses, public parks, and improved water-supply. He said he did not know if there was anyone present there that evening who was present thirty-five years ago. (Sir John Leng: "I was," and Mr. Charles Kerr: "Hear, hear.") He was very glad to hear that, and proceeded to tell what had been done for the good of Dundee by the municipality since 1871, also dealing with the programme of the Conference; and, after giving the members of the Conference a hearty welcome, referred to the presence of the French officers, his remarks being greeted with much applause.

Mr. DRUCE acknowledged the Lord Provost's kind reception. He said they might take it to themselves that the Conference in its various peregrinations had done a good deal, not only in the interests of pharmacy, for which, of course, they were especially bound to pray, but also for the benefit of the public at large, because the purity of drugs was a thing that came home to everyone. (Applause.) He could not admire the pointed expressions of the Chief Magistrate when he said that the fewer visits he paid to the pharmacist the better. He thought that was a thing they should at once put their foot upon. (Laughter.) In Dundee from any public official whatever every visit was a pleasant one to a pharmacist, and he could assure his Lordship that pharmacists had pleasant as well as unpleasant potions. In France—as he was quite sure the gentlemen whom they were proud to see there that night representing a country which all who have visited must truly love, where they had received that kindness and true hospitality which

were always characteristic of Frenchmen, would know—the people paid a great many visits to the pharmacists, not only for medicine, but to talk of the common topics of the day. It was the same in Germany, Italy, and Spain, and if wrapped up in the news there came some other little transaction—well, the pharmacists did not mind. (Laughter.) He had never been at a meeting of the Conference but some one or other had dilated on the purity of the water of the place. He had made many anxious inquiries, and applied to reliable authorities, but he had never yet found any material increase in the quantity of water taken during the sitting of the Conference.

(Laughter.) He hoped the Dundee Conference would mark a new epoch. He forgot the source of their water-supply. (A Voice: "Lintrathen.") Lin—Linth—he could not pronounce it. (Laughter.) He believed it was something about "Long Tom" or some other well-known distillery. (Renewed laughter.) In concluding, Mr. Druce expressed how very highly the delegates valued the personal kindness of the Lord Provost, and the all-round kindness with which they had been received. They would carry away to the remotest corner of the British Isles the knowledge that Dundee had a great and glorious past, and that by the spirit, which animated its public men it was doing a great work. (Applause.)

The concert was then proceeded with. It was excellent and gave much pleasure. The programme consisted of six songs and two duets. Miss E. U. Robertson sang "Idle Words" and "O dry those Tears," Miss Nellie Ogilvie "Scotland" and "A Dream of Home," and Mr. John R. Watson "Mona" and "Bonny Wee Thing."

The duets by Miss E. U. Robertson and Mr. J. R. Watson were "Life's Dream is O'er" and "Forlorn and Broken-hearted."

After the first duet the Lord Provost asked Sir John Leng to say a few words, and in reply the veteran journalist told a few stories, perhaps the best being that in which he said if he had brought out a People's Pill instead of the *People's Journal* and *People's Friend* he would have been a millionaire. He also told about a pill of a very searching nature, as well as his inimitable experience of Elliman's embrocation. Concluding, he referred to the presence of the captain of the French frigate *Ibis*. Captain Huguet, with whom he had the pleasure of lunching on Saturday, represented



WILLIAM HUNTER, Esq., D.L.
The Lord Provost of the City of Dundee.

La Belle France, a great and gallant nation, with a noble history, and which had produced some of the most distinguished men in all branches of literature and science. (Hear, hear.) He thought they did well to entertain strangers such as they were. In the war of some fifty years ago the flags of France and England flourished together. He hoped those two nations would never again in the future history of the world come in conflict and antagonism. (Applause.) France and Great Britain united ought, as they did in the time of the Crimean War, to lead the vanguard of civilisation. (Applause.) He expressed the hope that the countries might always act together, and added that he was sure that spirit was also felt and thoroughly reciprocated by Captain Hugnet. (Applause.)

Captain HUGUET was asked to say a few words, and, speaking in excellent English, said he had not the eloquence of Sir John Leng, but he was happy to hear what he had said, and to join himself with what he had said. On Saturday he drank to the good relations between England and France, and he was very happy and proud to hoist the English flag on the top of the mast of the *Ibis*. (Applause.) The French flag was on the foremast, and he hoped that the two flags would be always together, just as they were on that ship on Saturday. (Applause.)

The concert was proceeded with, and without interruption, except for a breakdown of the electric light, which was quickly remedied; and at the end Mr. James Russell proposed a vote of thanks to the Lord Provost and to Mrs.

Hunter for their entertainment, which his Lordship briefly acknowledged, and the proceedings closed with the singing of the National Anthem. It was a most delightful evening, and marks a new departure in the Conference-meetings, by transferring the official welcome from Tuesday morning to Monday evening.

Tuesday, August 12.

It was as beautiful a summer morning as one could desire, the warmth of bright sunlight being tempered by a cool breeze from the river. The chemistry lecture-theatre of the University College was found to be as pleasant in temperature, and it was comfortably filled when at 10.10 Mr. Druce came into it, accompanied by Dr. Mackay (Principal of the

College), Messrs. S. R. Atkins, N. H. Martin, J. C. C. Payne, and G. T. W. Newsholme, who sat to the left of the chair, and Messrs. Charles Kerr, F. Ransom, J. C. Umney, and E. S. Peck. The proceedings commenced without delay; [the PRESIDENT called upon Principal Mackay to give

AN OFFICIAL WELCOME.†

Principal MACKAY: Mr. President, ladies, and gentlemen,—I understand you have already been welcomed to Dundee, and welcomed in a most enthusiastic manner, by our Lord Provost last night. (Hear, hear.) He has told you of all

the great beauties and amenities of our city, and all the wonders we have for your observation. I need not myself dwell upon that subject, because the points are so self-evident that it would not be worth while to repeat them again. You are also, I understand, to make yourselves acquainted with the beauties of our river, and I need not dwell on that, for no words of mine could adequately paint to you those beauties: they must be seen for themselves. You are also, I understand, to have an opportunity of visiting two of our neighbouring cities—St. Andrews and Perth—both rich in historical associations, but with all this wealth of associations of the past I am sure you will find them quite up to all the most modern ideas. But while all that refers more especially to the lighter business of this Conference, the welcome which I wish to extend to you refers to the more serious and the more important work of the Conference—that which is done within these walls. (Applause.) I understand it is now thirty-five years since the



MRS WILLIAM HUNTER.

Conference visited Dundee, and I may say that I earnestly hope you will not allow such a long time to elapse again before you come back to this city. (Applause.) But those of you who were present thirty-five years ago at this Conference would find then no institution of the kind in which you are now met. If you come back in thirty-five years after this I feel sure none of you present to-day will be able to recognise the college then or see any likeness to what it is to-day. I am very proud to say that the great generosity of the citizens to the college has been manifested in a remarkable manner during the last six months—(hear, hear)—and that the college will be able to take at least some part in the great advance which all the Scottish Universities are making at present. (Applause.) We are putting up new buildings which will, when completed, make the College stand equal to any of its kind in Scotland.

[This report is continued on page 287.]

The President's Address.

Dealing with the History of Scottish Flora and its Exponents.

MORE than a third of a century has elapsed since in the early days of the history of this Conference it met at Dundee to receive a generous welcome from Scottish chemists, and to listen to a discourse from the lips of the genial occupant of the botanical chair of the Pharmaceutical Society, Professor Bentley, then President of this Conference, "On the Study of Botany in connection with Pharmacy," which was, in fact, a continuation of the subject he discoursed on at Nottingham the preceding year. In these addresses Professor Bentley showed how advantageous the study of botany is to the pharmacist, not only from a scientific but from a practical side. He proved how one conversant with botany is enabled to detect adulterants in drugs, instancing the recognition of the florets of *Carthamus* in saffron; that it gives a clue which is of great assistance in the search for new remedies; and mentioned remedies which had been obtained from our indigenous plants, such as the oleo-resin from the male fern and salicin from the willow and poplar. He then enumerated many of our native species which possess decided medicinal action, some of which at any rate were worth further and more complete trial. We must remember that at the time the professor was speaking the times were more favourable to the prosecution of truly scientific researches. In the present day the chief recommendations for a remedy to be adopted appear to be not so much its intrinsic value, but that its supposed qualities should have been lavishly vaunted by advertising through the medical Press, that its composition should be unknown, and that it should owe its origin to our continental or Transatlantic *confrères*. Professor Bentley went on to show that a knowledge of systematic botany is an important guide to the medicinal properties of plants, and how important the knowledge might be to a colonist or explorer, and, again, how useful it must be to the toxicologist. At Dundee he dwelt upon the subject chiefly to prove the value of botanical study not only as a mental training but as a means of recreation—such a study as would be eminently calculated to impart tone and vigour to the mind, to elevate the general character, and especially useful as it leads to correct observation and accurate discrimination; while from the fact that so large a proportion of the observations have to be made in the field, a use can be made of those hours which might be otherwise wasted in less useful and less wholesome pursuits.

After more than thirty years' experience few members of this Conference would venture to controvert Professor Bentley's statements. We may regret that systematic botany, which at the date of the last meeting in Dundee was taught by nearly every occupant of the professorial chairs of botany in the United Kingdom, is now almost without an expounder, with the result, as I said last year at Dublin, that Great Britain is falling behind her continental and Transatlantic rivals—a fact especially to be regretted when we remember the vast extent of the area which Greater Britain occupies and the immense share in the vegetable products of the globe which we possess. Even in such a limited branch as that of works treating of the botany of the British Isles, the output during the last twenty years does not compare favourably with that of France, Germany, Scandinavia, or the United States. This neglect of systematic botany extends to our own system of examination, but this is only in keeping with that unfortunate tendency to separate with ever-widening breach the practical from the theoretical knowledge of pharmacy in our examination system. The teaching of the two scientific subjects by instructors who have had no training in pharmacy, although perhaps unavoidable, necessarily tends to produce the same effect, so that the time is not far distant when what has been seriously asked for will be a *fait accompli*—namely, that qualification shall precede, and not follow, business training. The results are only too manifest in the deficient practical knowledge of the general routine of business affairs which characterises so many of the graduates

of pharmacy of the present day; nor can we praise a system which produces results which all of us acknowledge and most of us deplore.

Gentlemen, I must apologise for appearing before you to-day, for I feel fully cognisant that I can offer you but little that is interesting, but I must throw myself upon your kindness and long-suffering, of which I have had previous experience. Knowing Scotland so well as I do, and being so greatly attached to it as I am, I felt it very difficult to refuse the kind and flattering invitation to act as President of this Conference in this historic burgh. My only claim for your indulgence is my knowledge of these northern realms, for since I was a boy of sixteen few years have gone by without my having spent some of my limited leisure, those *horæ subsecivæ* so much the more valued when difficult to obtain, in the country north of the Tweed. And I may say in further extenuation of my temerity, that as one who has tried to follow Professor Bentley's advice, each of these many visits has had for its primary object the working out of the flora of those Scottish counties of which little was known. Therefore I trust you will pardon me if I dilate for a time, but in a confessedly inadequate and incomplete manner, upon

THE PROGRESS OF SCOTTISH BOTANY,

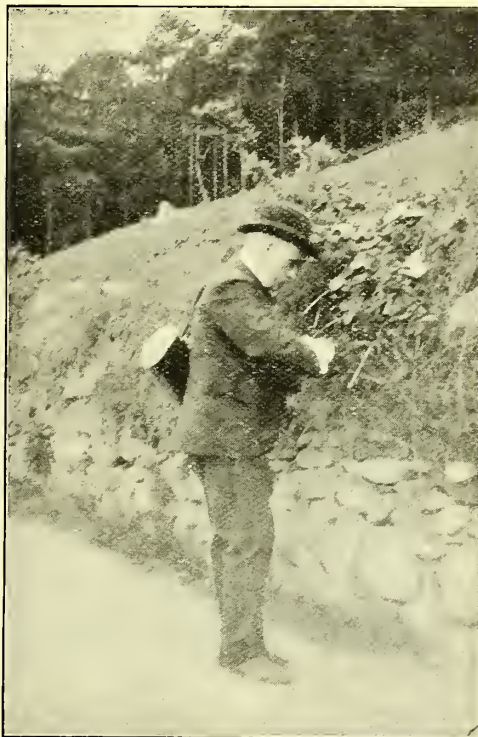
taking as an arbitrary starting-point the year 1684. This date is chosen because the records of the occurrence of plants in Scotland which had been made prior to that time were isolated, such as that of the round-leaved wintergreen and the pine-tree in Parkinson's "Theatrum Botanicum" of 1640; and although certain edicts about the extermination of the corn marigold from corn-crops had been promulgated, and Cargill had sent records of *Trientalis europæa* to Caspar Bauhin for insertion in the "Pinax," while a few others were inserted in the "Catalogue of Plants" which the great naturalist Ray issued in the year 1670 when his colleague Thomas Willis added to the British flora the viscid catchfly from the cliffs of Samson's Ribs, these were, as I have said, merely isolated references, and we may truly say that less was known at the date I mention by English botanists of the Scottish flora than they now know of the Egyptian or Burmese. As a rule the English excursionist to Scotland in the seventeenth century received no very cordial welcome, especially when, as was more frequently the case, their visits were not for strictly scientific purposes (laughter), and if any of the latter category really took place, no trace of their explorations exists so far as botany is concerned. Even as late as the eighteenth century, as many of you will remember, Boswell in his "Journal of a Tour to the Hebrides" with the great lexicographer Samuel Johnson, speaks of such an undertaking in a more serious light than one would now feel if he contemplated a visit to the Caucasus. Johnson says he "was prepared for some inconveniences and hardships, and perhaps a little danger, but these he thought were somewhat magnified—as, for instance, by Voltaire, who looked upon him with great wonder when he heard of his intention, as if he had talked of going to the North Pole, and, being asked if he wished Voltaire to accompany him replied 'No, sir.' 'Then,' said Voltaire, with that charming touch of unselfishness which is even occasionally the attribute of philosophers, 'I am very willing you should go.'" You will remember that on this journey Boswell and Johnson visited Montrose, and to prove how multifarious his learning was Dr. Johnson went into an apothecary's shop and ordered some medicine for himself, writing the prescription in technical characters, so that the *Boy* took him for a physician. As no ill result followed, we may assume that the doctor's characters and the boy's interpretation of them were both unimpeachable; and we also get a side-light thrown upon the employment of unqualified labour, showing that it is hallowed by ancient usage, at any rate so far as apothecaries are concerned. (Laughter.) My starting-point is the year 1684,

when a book appeared which treated of the natural history of Scotland under the title of "Scotia Illustrata sive Prodrromus Historiæ Naturalis," &c., by Robert Sibbald, which was compiled on somewhat similar lines to that excellent work on the natural history of Oxfordshire by Dr. Robert Plot which was published in 1677, and, like that work, besides treating of natural science in its broader meaning, also enumerated with some degree of thoroughness the flora of the district under review. Sibbald, who may be not unjustly termed

THE FATHER OF SCOTTISH BOTANY,

was born in Edinburgh in 1641, being the son of the third brother of Sir David Sibbald. In 1650 he was sent to the Burgh School of Cupar Fife, but the next year his parents removed to Dundee, where, during the time of trouble caused by the siege of the town by Monk, young Sibbald narrowly escaped with his life, and his father was severely wounded. During the pillage of the town the family were robbed of nearly all they possessed, and had to return to Cupar Fife on foot. Young Sibbald was then sent to the Edinburgh High School, and eventually to the University. In 1660 he went to Leyden for eighteen months, where he took the degree of M.D., then studied for nine months in Paris, and proceeded to Angers, where he took the degree of M.D. in 1662. On his return to Edinburgh, and stimulated by the example of the University of Oxford, which in 1632 had established a Physick Garden, in conjunction with Sir Andrew Balfour he was instrumental in forming the Botanical Garden at Edinburgh in 1680. This was so excellently cultivated by James Sutherland that in 1683 it is said to have contained 3,000 species of plants, disposed according to the method of Robert Morison, a native of Aberdeenshire,

and Regius Professor of Botany in the University of Oxford, who published the first volume of his "Plantarum Historiæ Universalis Oxoniensis" in 1680. Sibbald was also instrumental in founding the College of Physicians in Edinburgh, for which a Charter was obtained on November 2, 1681, and of which he was appointed President in 1684, this year also witnessing the publication of his "Scotia Illustrata," already alluded to, and which, from its containing a list of 381 species and varieties of plants

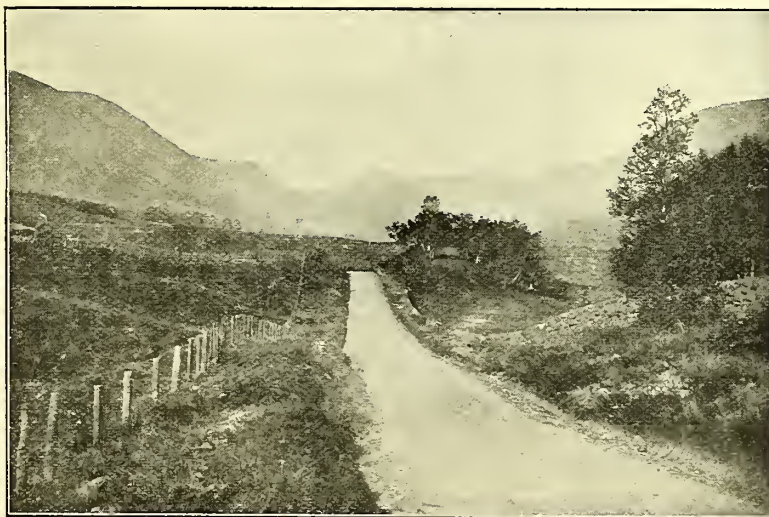


MR. DRUCE AT HIS FAVOURITE OCCUPATION.

Snapshot by Mr. E. S. Peck.

dition in Scotland, and of which nearly 500 are mentioned, besides colour-forms and varieties; but many of the species given are not really native plants of Scotland, and some are difficult to identify. It is rather remarkable that so few truly Alpine or even typically Scottish species are included; indeed, only two species are recorded for the first time as British—namely, a rosaceous plant which was put into a separate genus named *Sibbaldia* by Linnæus in the first edition of the "Species Plantarum" in 1753, but this genus is now merged with *Potentilla*, and the plant, instead of

being called *Sibbaldia procumbens*, is known as *Potentilla Sibbaldi*. The second species is that interesting umbelliferous plant *Ligusticum scoticum*. These are practically limited to Scottish localities. Sibbald's list, however, contains several other interesting plants; for instance, the Forked Spleenwort (*Asplenium septentrionale*) and *Lychnis Viscaria*, which had been discovered by Thomas Willis in 1670 on Salisbury Crag, but now nearly eradicated from that locality. A few species of mosses, seaweeds, and fungi are also



GLEN CLOVA FROM CADHAM.

Botanising ground familiar to the Conference President.

Photo by Valentine & Sons (Limited).

included. Alexander Pitcairn, the writer of "Vita Morisonii," criticised Sibbald's book virulently.

A GAP OF A CENTURY.

Between the years 1630 and 1777 very little published work exists which adds anything to our knowledge of Scottish botany. In Martyn's Tournefort *Carum verticillatum* is recorded in 1732, and *Eriocaulon septangulare* from Skye is reported in the Phil. Trans. for 1770. The times were unpropitious and the influences adverse to the spread of scientific knowledge. Civil wars went on in a most incivil fashion, foreign wars were waged which shut out Britain from continental intercourse, and but little more was known of Scottish botany ninety years after the appearance of "Scotia Illustrata" than could be gained from the pages of Sibbald's book. It was reserved for an Englishman to make the next considerable advance in the knowledge of the flora of these northern lands in the issue by Dr. John Lightfoot of the "Flora Scotica" in 1777. Lightfoot was born at Newent in Gloucestershire in 1735, and was educated at Crypt School, Gloucester, entering Pembroke College, Oxford, in 1753, taking his degree of B.A. in 1756, and his M.A. in 1765. Having entered Holy Orders, he became chaplain and librarian to the Dowager Duchess of Portland, that well-known lover of botany, at her beautiful seat of Bulstrode in Bucks, she being attracted by his cheerful disposition, courtly manners, and love for botany and conchology, for which her Grace paid him the not exorbitant stipend of 100*l.* a year; but he also had the curacies of Colnbrook and Uxbridge, holding the latter to the day of his death. He held the living of Shelden in Hampshire and Gotham in Nottinghamshire, and then Cowley in Middlesex. In 1772, by the invitation of the celebrated antiquary Pennant, he travelled with him through Scotland, as he says,

from the south of Annandale to Sutherlandshire, visited most of the Hebrides except the Long Island, traversed the kingdom from Argyshire to Mearns—that is, from the western to the eastern shore—and afterwards returned from England by way of Edinburgh and Kelso; that in all this tract, which took up the daily exercise of a whole summer, I embraced every opportunity of scaling the highest mountains, climbing the most rugged rocks, penetrating the thickest woods, treading the fallacious bogs, winding upon the shores of seas and lakes—in short, of examining every variety of land or water which promised to produce a variety of vegetables."

LIGHTFOOT'S "FLORA SCOTICA"

was written in 1777, and was issued a year later, at the expense of Pennant, in two volumes. As was the case with Sibbald's book, it met with some severe criticism, but the initial merit of the "Flora Scotica" was too great to suffer long. Pennant supplied about sixty pages, in which the fauna of Scotland is described; the remainder of the 1,147 pages are devoted to the flora, in the preparation of which Dr. Lightfoot acknowledges his indebtedness to several scientists, among whom may be mentioned Dr. Hope, Professor of Botany at Edinburgh, and the Rev. Mr. Stuart, jun., of Luss, formerly of Killin in Breadalbane, the companion of Lightfoot through the Highland journey, who was well versed in the Gaelic language, and who was the discoverer of several new plants. The Rev. Dr. Burgess, of Kirkmichael, in Dumfriesshire, contributed notes on the Lowland botany; others were made by Dr. Parsons a student of Edinburgh, afterwards Professor of Anatomy at Oxford; and Mr. Yalden, a medical student of Edinburgh, supplied a catalogue of plants growing in Edinburgh Park. Lightfoot also acknowledges assistance given by Dr. Solander, Sir Joseph Banks and Dr. Sibthorp, of Oxford, the last-named allowing him to consult the valuable "Cryptogamic Herbarium" of Dillenius. One may mention in passing that while staying at Oxford, Lightfoot added several plants to the Oxfordshire flora, among them being the fritillary or snake's head, a conspicuous ornament of our Oxford meadows which had strangely enough not been recorded previously. The cryptogams are very largely represented in Lightfoot's flora, 119 species of mosses, 103 lichens, 81 algae, and 87 fungi being described. The flowering plants and ferns are about 840 in number, but a large number of these are only naturalised plants in Scotland. About 1,250 species altogether are therefore included in the flora.

The closing years of the eighteenth century are best considered in connection with

THE WORK OF SIR JAMES E. SMITH,

who, in his important contributions to the knowledge of British botany, focussed much of the scattered information relating to British plants. It will be unnecessary to enter into any biographical details respecting such a well-known *savant*, but I may remind you that we are also indebted to his acumen for obtaining the valuable herbarium and collections made by Linnæus, which are now preserved in the Linnean Society—a society of which he was also the primary founder. His *magnum opus* was English botany, in which he described the plants of the United Kingdom in thirty-six volumes, which was begun in 1790 and finished in 1814, the plates being from the hand of James Sowerby. In the interim Smith had also produced the "Compendium Floræ Britannicæ" and the "Flora Britannica," the latter in 1800–4. These works contain upwards of a hundred additional species to the Scottish flora, besides numerous varieties, but many were only naturalised and not native species. In addition about a score were recorded which are either erroneous or require recent verification. On the other hand numerous willows, which were then described as species, are now considered to be only varieties, hybrids, or forms, and these are not reckoned in the additional species cited above.

It will therefore be seen how important was the contribution to Scottish botany which we owe to Sir James E. Smith. He was fortunate in enlisting a number of botanists, for although he himself visited Scotland and climbed Ben Lomond, where he gathered *Luzula (Juncoides) spicata*, he did not himself add materially to the flora. Some of the above 100 additions are preceded in other publications. I have neither time nor space to notice all, but I may in passing refer to a list of plants published in the Linnean Society's *Transactions*, which was read at a meeting in 1793 by James Dickson, a nurseryman of Covent Garden, who had made two journeys to Scotland—one in 1789 and the other in 1792—and between 1793 and 1802 issued a set of of nineteen fasciculi of plants. To Dickson we owe the discovery of some rare alpine.

Other coadjutors of Smith were John Mackay, of the Leith Walk Nurseries, Edinburgh, and James Townsend Mackay, a native of Kirkcaldy, afterwards curator of Trinity College Gardens, Dublin, and who did much good work at the Irish flora (see "Cyb. Hib." ed. 2, pp. xxviii–ix). To one or other of these we owe the records of the so-called *Poa lava*, *Festuca sylvatica*, *Scirpus Tabernæmontanus*, *S. multicaulis*, *Pyrus pinnatifida*, *Pinguicula alpina* (with some doubt), and some others contemporaneously with George Don.

James Brodie, of Brodie House, discovered the rare and beautiful *Moneses grandiflora*, which was figured in 1794 from the woods of his charming neighbourhood, and also *Erythraea littoralis* as the form *minor*, Hartm., from the Elgin coast, which Smith misnamed *Chironia pulchellum* (*E. ramosissima*).

Professor Beattie, of Aberdeen, was the discoverer of the beautiful *Linnaea borealis* to the British flora from the fir-woods of Mearns, and of *Carex Davalliana* (but Smith was in error in so naming it, as it is only a form of *C. dioica*), *C. laevigata*, *C. Micheliana* (a variety of *C. flacca*), and *C. binervis* (*E. B. t.* 2236), all of which Smith described as new species from Beattie's specimens from the neighbourhood of Aberdeenshire.

But the chief worker at the Scottish flora for many years was a botanist who has received a most unfair share of neglect and misrepresentation, which I hope may be in some degree dispelled at any rate from the minds of such of you who may have been influenced against him. I allude to

A FORFARSHIRE MAN, GEORGE DON.

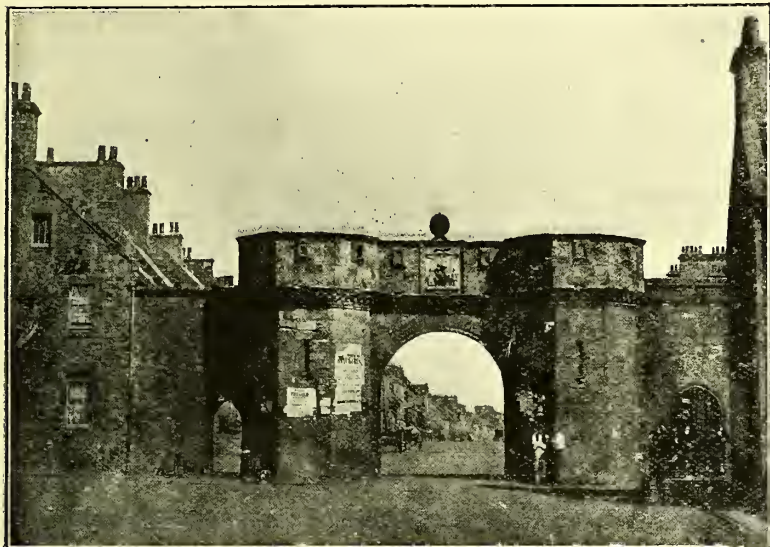
It was once my misfortune to dislocate my ankle while on a botanising expedition in Forfarshire, but the accident met with compensating advantages, for I used some of my enforced leisure in examining a collection of plants which had been made by Don and now in the possession of Mr. John Knox, of Forfar. At that time I shared the current opinion about Don, and treated his records with scanty respect, since over twenty species are mentioned in Hooker's "Student's Flora" to be "Don's reputed discoveries." My

examination of his herbarium and of the fasciculi issued by Don led me, however, to take a different view, and in 1884 and 1885 I published a series of articles in the *Scottish Naturalist* on "The Botanical Work of George Don," from which I abstract some of the following remarks, supplement-

active energetic woman, to whom he was afterwards married.

On leaving Dupplin he went southwards, spending a short time near Bromsgrove, in Worcestershire, in 1784, then returned to Edinburgh, where he became friendly with Messrs.

Mackay and Dickson. About 1790 he settled at Forfar and with the small sum of money he and his wife had saved leased at a low rent, from Mr. C. Gray, of Carse, two acres of land, on the condition that he should build a cottage of certain dimensions within a limited period. This piece of ground, which he called Dove Hill, sloped to the west into what at one time had been Forfar Loch. Here he formed a large artificial pond, which he stocked with aquatic plants and fish, leaving room for a broad border, in which the native plants were arranged according to the Linnæan system and grown in their appropriate soils. In addition, he rented several acres of land as a nursery for young trees; but it is said he gave more time to his botanical treasures than to the more profitable cultivated sorts. About this time he was particularly eager in exploring the Highlands, and not the least interesting of his discoveries is that of the beautiful district of Clova, which he first made known to the botanist. He occasionally absented himself for a week at a time, his plaid, and a bag of oatmeal or some bread and cheese, sufficing him for shelter and sustenance; and he lost count of the



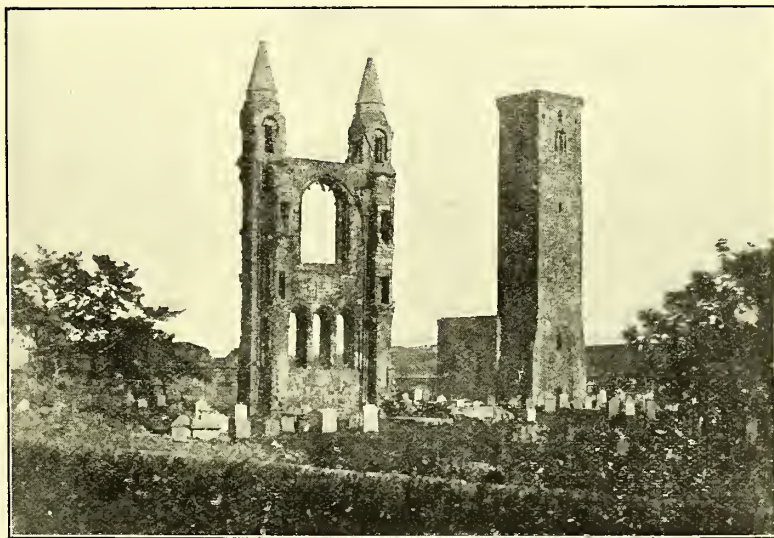
WEST PORT, ST. ANDREWS.

This and other St. Andrews pictures are from photographs 59 years old, lent by Mr. Alex. Govan.

ing them with such additional information as may have come to my knowledge. I am also indebted to the "Biography of George Don," by John Knox, in the *Scottish Naturalist*, April-October, 1881, which gives a vivid picture of Don, and also a memoir by Patrick Neill, LL.D., of Canonmills, in the third volume of the *Botanical Gazette*. C.C.

George Don was born in the parish of Muirhead in 1764, and was baptized in October, his father being Alexander Don and his mother Isobel Fairweather; both parents were descended from respectable farmers in the parish, and his father was a shoemaker or currier, who afterwards settled in Forfar. George Don received the ordinary elementary education at the parish school. He had a natural turn for mechanics, and acquired a taste for reading and observation, but his real education was got out of doors, in the fields and by the loch-side, and from his boyish days he took delight in noticing the minute characters of such birds, insects, and plants as came within his reach. He wrote a bold hand, and his style was clear and vigorous. He was apprenticed to a clockmaker in the town of Dunblane, and there formed his first *hortus siccus*, consisting of all the flowering-plants and mosses which he could collect in the neighbourhood. When he became a journeyman he removed to Glasgow, and there he generally worked five days a week at his business, being able to make a clock in that time, and the rest of the week was devoted to botanical exploration; occasionally he stole an extra day or two, penetrating into the Highlands as far as to Ben Lomond or Ben Lawers. He afterwards went as a gardener to Dupplin Gardens, where a relative was in charge, and there he spent some years, using his scanty leisure to explore the Ochills and even the spurs of the Grampians, thus obtaining a good knowledge of the local flora. On one of these expeditions he met Caroline Stewart, an

days in these toilsome expeditions, so that it is said he once presented himself at the manse of St. Vigean laden with specimens on a Sabbath morning as the occupants were going to kirk. There he met his friend the minister, and asked him, "What day is 't—fast or Sabbath?" He got his answer, and replied, "Man, I have lost count, but if I had my hands and face washed I would gang to the kirk too." (Laughter.) He was shown to a bedroom, but when Mr. Muir, the minister, went to call him he found him fast asleep. He had it



RUINS OF CATHEDRAL, ST. ANDREWS, AND TOWER OF ST. REGULUS.

out. Not only Clova was repeatedly worked, but he visited the distant Ben Nevis, where he gathered *Sagina alpina*. When on Ben Lawers in 1793 he observed the long-legged plover and gathered *Arenaria sulcata*, &c. For these long rambles he was especially fitted, being stalwart and blessed

with great powers of endurance, often journeying without breaking fast for a period of twelve hours. He would bring home a heavy burden of plants for his herbarium or roots to be planted in his garden, or, as was frequently the case, for sale to correspondents scattered over Britain. One of these correspondents was the Countess of Aylesford, who had set herself the task of making water-colour drawings of the British plants, and she early enlisted the aid of Don. The drawings are now in the possession of a descendant, the Dowager Countess of Dartmouth, and the plants, instead of being thrown away, were kept, and are now in the collection of another descendant of Lady Aylesford's—my friend, Miss C. E. Palmer, of Odiham—and an examination of them confirms my opinion as to the *bona fides* of Don. He sent many specimens to Sir J. E. Smith which are figured in "English Botany," and to Dr. Goodenough, afterwards Bishop of Carlisle. It is said that he once received a visit from the Bishop, who, being at Forfar, and inquiring for Mr. Don, was first taken to the house of a Colonel Don, and finding that was not the man, he was conducted to the botanist, whom he found busy at work and with whom he was soon in cordial conversation, to the wonder of his guide. Dr. Neill also relates that,

being on a pedestrian excursion along the east coast it occurred to me that Forfar ought to be visited for its remarkable botanical garden and its owner, whose fame was familiar to me, owing to my intimacy with his regular correspondent Mr. John Mackay, of the Leith Walk Nurseries. On reaching Forfar towards evening I soon found Don's garden, and entering inquired of a very rough-looking person with a spade in his hand, whom I took for a workman, whether Mr. Don was at home. The answer was, "Why, sir, I am all that you will get for him." Having apologised in the best manner I could I stated that when I left home I did not anticipate a visit to Forfar else I could have brought a letter of introduction from Mr. John Mackay. Don pointed to my botanical box and immediately said, "That is enough for me." . . . Next morning at six he conducted me to Restennet Moss, where I had the great satisfaction of procuring a living patch of *Eriophorum alpinum*, and a number of fine specimens for drying. The Moss was at this time partially drained, for the sake of a rich deposit of marl, but at one end there was still sufficient marsh for the growth of *Cladium Mariscus* and *Eriophorum angustifolium*, and of course for the rare *E. alpinum*, which grew in the drier and firmer part of the Moss."

At the end of the year 1792 Sir J. E. Smith and Mr. James Brodie of Brodie strongly recommended Don to Professor Rutherford, of Edinburgh, as a Superintendent of the Botanic Garden there; he was accordingly appointed, and removed to Edinburgh, leaving his Forfar garden in the care of his father, who was himself a great cultivator of flowers for amusement, but followed the trade of a currier. Don only remained three years at Edinburgh, as the relations between the professor and himself became strained, for while Don had comparatively little experience of stove-plant cultivation, there is no doubt his botanical knowledge was far in advance of the professor's. (Laughter.) During his residence at Edinburgh he attended medical classes, with the view to ultimately following that profession, and on his return to Forfar in 1795, it is said, he started practice; but his love of botanical rambles told heavily against him, and as he was so frequently away when wanted his practice gradually dwindled. In 1803 he was elected an Associate of the Linnean Society in recognition of his services to botany. In 1804 he began the publication of a "Herbarium Britannicum" which was dedicated by permission to Sir Joseph Banks, then President of the Royal Society. Four fasciculi, each of twenty-five plants, were to be issued yearly, and these were to contain a due proportion of rare alpine.

"Since he first began his botanical excursions into the Highlands of Scotland, in the year 1779, he is confident (and he hopes he may mention it without the imputation of vanity) that he has traversed more of the Caledonian alps than any other botanist has ever done. He has repeatedly ranged over the great mountains of Angushire which surround the great district of Clova, where no one on a similar pursuit has ever preceded him. He has also scarched the vast range of mountains which stretch about sixty miles through the district of Knoydart, in Inverness-shire, a region which had never before, nor has since, been examined by a botanical eye. He is the only botanist, too, who has explored the lofty mountains of Cairngorm and the great hills of the neighbourhood." So he wrote in his preface.

As time went on Don's business became more and more scanty until in 1812 he had to come to some sort of arrangement with his creditors, and from this blow he never recovered. He came home in the autumn of 1813 from one of his excursions, labouring under a severe cold, which he neglected; he grew worse, and a suppurating sore throat followed, which caused him excruciating agony for six weeks, when he succumbed in the January of 1814—he and his family being during his last illness so poor as to literally depend for their daily bread on the charity of the neighbours. His funeral was one of the largest that had ever been seen in Forfar, then having a population of about 5,000: the whole town as well as many friends and acquaintances from the country followed the coffin to the grave in the churchyard.

Through the efforts of Dr. Neill, Mr. Booth and Sir J. E. Smith a sum of money amounting to 80*l.* was collected, and this was remitted to the widow so that she was enabled to bring up her children, six in number. The eldest, a girl, died shortly after her father. Of the five boys three became nurserymen; but David and George, having considerable ability, struck out new paths, the former eventually becoming a celebrated botanist and Secretary to the Linnean Society.

DON'S CHIEF PUBLICATION

was "An Account of the Native Plants in the County of Forfar, and the Animals to be Found there" forming an appendix to the "General View of the County of Angus or Forfar," by the Rev. James Headrick, Minister of Dunnichen, which appeared in 1812. Don's share extends to forty-nine pages. He mentions ninety species of flowering-plants, 100 mosses, and 120 lichens from Clova. The sub-alpine plants lying between the alpine district and the lowest part of the valley of Strathmore are noticed; there he discovered *Caltha radicans* and *Crepis pulchra*, the latter a casual plant since extinct (E. B. 2325, and Syme, E. B. v. 217). Then he discusses the flora of the lochs and marshes in the neighbourhood of Forfar, where he planted *Stratiotes*, and he noted nine species of pondweeds from Rescobie Loch. He next describes the plants growing between the valley of Strathmore and the sea. Lastly the sea-coast, from North Water Bridge, Montrose, Arbroath, Sands of Barrie, Dundee, and the banks of the Tay to the western boundary of the county, are pleasantly described. Altogether about three hundred "larger plants" are enumerated, and he says that most of these could be seen growing in his garden at Forfar.

As I have said, his botanical reputation has since suffered, especially at the hands of Dr. Walker Arnott, of Glasgow, from the fact that of all his many records about a score have not been re-found in the localities given by Don.

These unverified records may be divided into three groups. The first consists of casual plants which are always, as their name implies, uncertain in their station. The second group consists of plants which have been wrongly identified either by Don or by Sir J. E. Smith (to whom they were sent): they do not affect Don's good faith. The third group consists of certain plants which Don definitely records with preciseness, but which at present have not been gathered by any other botanist either in the locality given or elsewhere as a native of Britain.

A CRITICAL EXAMINATION

of a list of Don's discoveries enables us to bring his work into more correct focus, and to obtain a position favourable to arrive at a more accurate idea as to the authenticity of his records. But it is only fair to remember that in the time when Don lived the same precision of locality was not demanded of the botanist, nor was the same importance attached to the fact that a specimen should come from the locality printed on the label as is now given. Then the specimen itself was valued just as a stamp is now valued by the philatelist, and the other factors as to where it came from or by whom collected were to some extent ignored. Therefore we find that Don, even in his own herbarium, wrote out the localities of certain species from text-books before the plants were obtained; indeed, in some instances the space for the plant is still unoccupied. By this practice a loophole for error is at once presented. Again, the geography of Scotland was imperfectly known, so that Don was often very vague in his localities; and if, as sometimes occurred, he gave them from memory, another source of error is offered. Then, too, Don was a florist, and a florist in poor circumstances, and it is quite

conceivable that he may, in some instances, have intentionally withheld the exact locality from business motives, so that another in the same trade should not take toll. And it must also be borne in mind that when he lived no British botanist had any but the most elementary knowledge as to the indigenuity of plants. We therefore find that in such a



COLLEGE CHURCH AND STEEPLE, ST. ANDREWS

standard work as "English Botany" a large number of species are inserted which have no claims to be considered natives of Britain, although found growing in a wild state; and this is even true of Sir W. Hooker's "Flora Scotica." We therefore need not be surprised to find Don recording such alien plants as *Hypericum barbatum*, *Cherophyllum aureum*, &c. Then Don brought home many specimens, either in seed, root, or flower, and grew them in his garden; and anyone who is conversant with the difficulties under which all botanical gardens labour in the shape of misplaced labels, the encroachment of one species upon the domain of another, in the case of annuals by seed-scattering, or in perennials by root-creeping, one need not be surprised to find that Don, poor and overworked as he was, with three hundred British species in his Forfar garden, may have fallen a victim to the unconscious transference of labels or specimens. To one or other of these causes may, I think, be attributed the records of such plants as *Potentilla tridentata* and *Tussilago alpina*, and we need not insult his memory, or demean ourselves, by imputing gross attempts to impose upon the credulity of his fellow-botanists. On the other hand, we must remember with gratitude the enormous energy which enabled him to add such a lengthy list of species to his country's flora. This work was done, as so often it is obliged to be done, against adverse influences, and without the advantages of rank and fortune, but with the compensating assets which untiring zeal, patient industry, and that inborn touch of genius give to any of Nature's children who have been enriched with its heritage—that something which no worldly gifts can endow us with in a similar way. Don unmistakably was so gifted, and it kept him steadfast at his labours. He had besides that talent of discriminating slight differences which is lacking to many systematic botanists; but none can be truly great who is not its possessor. This discriminating power is evidenced again and again in his acute remarks upon his specimens. (Hear, hear!)

As I have said, Don was too independent in opinion to curry favour with the wealthy, and too fond of Nature—by which I mean Science in the truest sense, that hard mistress in some respects as she is to the poor—to make himself rich by continuous application to business. George Don, like Robert Dick, is an instance—and there are many in the working classes—of a life devoted to one idea; heroes assuredly, yet reaping no reward, except such reward as earnest and true work done for its own sake itself confers. (Applause.)

Yet, despite the apparent failures of such lives as Robert Dick, George Don, and Thomas Edwards, they stand out in marked and agreeable contrast to the insipidities, the mediocrities, or the merely fashionable crowd. If any one of those who have lived these self-sacrificing lives has committed errors—and who among the wisest has not?—for the sake of justice let us deal mercifully with him, and certainly not bring lightly charges against his good faith. In the case of Don, some of us, and assuredly all of us who have trodden over the same lovely country which he has made known to us, and who have gathered in the same localities the rare and beautiful specimens he has discovered or has left records of, will assuredly feel not only gratitude for what his labours have gained for us and made our common possession, but also respect for the independent and sturdy character of the man who lived such a life of toil and endurance.

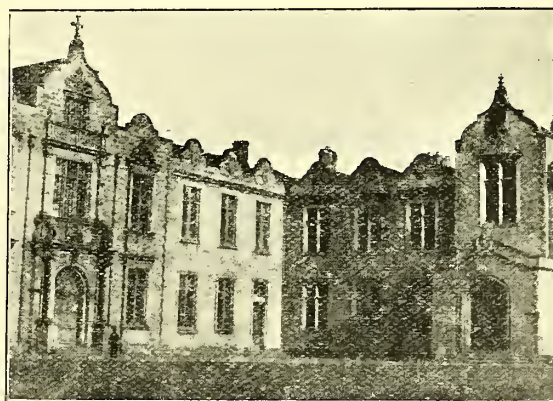
OTHER BOTANISTS.

At Don's death the garden at Forfar was taken over by Thomas Drummond, but he did not retain it long, as he became Curator of the Belfast Botanic Garden, and accompanied Franklin on his second Arctic Expedition, afterwards collecting specimens in America, Canada, and Texas. Drummond issued two fascicles of Scottish and two series of American mosses. He stands as the first recorder of *Juncus balticus*, Willd. (see E. B. 2621 [1830]), but that had been found previously by Geo. Don and thought to be *J. filiformis*.

William Borrer, a well-known English botanist, who contributed some important discoveries to the Supplement to "English Botany," made visits to Scotland and added several species to our flora. Arthur Bruce, Secretary to the Natural History Society of Edinburgh, recorded *Polygonatum verticillatum*.

Thomas Hopkirk, of Paisley, published a "Flora Glottiana" (1813), in which one new species is described—namely, *Veronica hirsuta*, from Ayrshire, but it is now considered to be only a variety of *V. officinalis*. Hopkirk enumerates altogether some 662 species, of which about forty are additions to the Scottish flora, but they consist principally of aliens and casals. The list is obtained chiefly from the banks of the Clyde and the neighbourhood of Glasgow.

Sir William Jackson Hooker, born at Norwich in 1785, became Regius Professor of Botany at Glasgow in 1820, and was so well-known and distinguished a botanist that I need but make the barest reference to him. At the time he went to Glasgow he was already the author of the "British Jungermanniæ" and of "Muscologia Britannica." Having travelled, as he tells us, once in company with Mr. Borrer, and another time with Mr. Turner, the excursions extending over by far the greatest part of the country, in 1821 he



COLLEGE OF ST. SALVADOR, ST. ANDREWS.

published a "Flora Scotica" dedicated to the Duke of Montrose. In this work Sir William Hooker describes 1,071 species of flowering plants and fifty-two of the higher cryptogams as occurring in Scotland, but from this total must be deducted the balance of twenty-two left after subtracting those plants—twenty-one in number—which are now

considered to be species, but which Hooker treated as varieties, from the larger number of forty-three, to which in the "Flora Scotica" full specific rank is given, which are now considered to be only varieties. There is also a considerable proportion of errors, amounting to forty-two, so that about 1,059 species are actual constituents of the Scottish flora. A very considerable number of these are only naturalised, and not native species. To George Don, wholly or in part, nearly fifty records of species are due. Altogether about ninety species are added to the Scottish flora. To Sir William Hooker we also owe the publication, either in the Comp. Bot. Mag. or in the five editions of the "British Flora," 1835-1842, of many new discoveries.

Alexander Murray, of Aberdeen, published in 1836 the first part of the "Northern Flora," a description of the wild plants belonging to the North and East of Scotland, which, however, did not add anything of special interest.

David Don, son of George Don, of Forfar, afterwards Librarian to the Linnean Society, contributed a paper to the Wernerian Society which described several Scottish plants.

Robert Kaye Greville, of Edinburgh, published the "Scottish Cryptogamic Flora" in 1823-28, "Flora Edinensis" in 1824, and the "Algæ Britannicæ" in 1830. These important works did much to forward the knowledge of Scottish cryptogamic botany, but Dr. Greville also was the joint discoverer of those rare alpine *Carex alpina* and *Astragalus alpinus*.

Dr. George Gordon, of Birnie, near Elgin, published in 1839 "Collectanea for a Flora of Moray." He discovered *Pinguicula alpina* in the Black Isle in 1831, although James Mackay is said to have gathered it in Skye previously, but the record awaits confirmation.

Professor John Hutton Balfour, of Edinburgh, published a "Flora of Edinburgh" and its environs in 1863, and by taking his class of botanical students into the mountainous districts did much to encourage botanical research. He added *Sagina nivalis* to the British flora, which was gathered in 1847, but remained undetected in his herbarium until 1863.

Professor George Dickie, of Aberdeen, the author of "Flora Aberdonensis," 1839, and the "Botanist's Guide to Aberdeen," 1860, was among the first to discover *Eleocharis uniglumis*, and was the joint discoverer of *Carex lagopina*, *C. rupestris*, and *Cystopteris Dickieana* to the British flora.

Professor Robert Graham preceded Sir W. Hooker in the chair of botany at Glasgow, and afterwards became professor of botany at Edinburgh. He added *Ononis reclinata* to the British flora from the Mull of Galloway.

William Gardiner, an umbrella-maker in Overgate, Dundee, published in 1848 the "Flora of Forfarshire," arranged according to Hooker's "British Flora." In the introduction, Forfarshire is computed to contain about 537,600 acres, of which about 200,000 are under cultivation, the soil being rich and most variable, rising from the sea-level to over 3,000 feet. Gardiner gives an excellent description of the mountainous part known as the Clova district, and he is among the early observers or recorders of *Silene conica*, *Myosotis cespitosa*, *M. collina*, *Lucula erecta*, *Lolium multiflorum*, *Mimulus*, *Rhinanthus major*, &c.

RECENT WORK.

Time will not allow me to trace the building-up of the Scottish flora further, except in epitomising to say that Mr. H. C. Watson explored Scotland in order to trace the distribution of species, not only geographically but also through the various zones of altitude, and his work on the "Geographical Distribution of British Plants" (1835), his "Cybele Britannica" (1847-60), and other publications show how much we are indebted for his scientific and thorough research. James Backhouse, of York, explored the districts of Braemar and Clova, and his work on the "British Hieracia," published in 1856, added many species to our flora. More recently, Mr. A. Brotherston, of Kelso, added *Potamogeton Zizii*; and Robert Dick, the baker naturalist of Thurso, immortalised by Smiles, found *Hierochloa borealis* and *Calamagrostis strigosa* in Caithness. To John Thomas Irvine Boswell, formerly Syme of Balmuto, Fife (whose wife was a descendant of Boswell, the biographer of Dr. Johnson), we owe the preparation of the third edition of "English Botany," published between 1863 and 1884. He added *Zannichellia polycarpa* to our flora, and in his

magnum opus did much to assist British botanists by the excellent descriptions he drew up.

Dr. Buchanan White, of Perth, a born naturalist, whose premature death all must deplore, published an "Excellent Revision of the British Willows," and compiled a "Flora of Perthshire," published posthumously under the able editorship of Professor Traill, of Aberdeen. Dr. Buchanan White did excellent and systematic work, describing several new varieties and adding much to our knowledge of the comital distribution of Scottish plants, as well as re-finding *Salix Doniana*. John Sadler, curator of the Botanical Gardens at Edinburgh, discovered in 1874 a sedge which he thought was *C. frigida*—i.e., *Carex Sadleri*—and a hybrid willow, *Salix Sadleri*, in Glen Callater. Abraham Sturrock, of Rattray, a Forfarshire man and a valued friend of my own, explored the lochs in his charming neighbourhood, and was rewarded by finding a new pondweed, *Potamogeton Sturrockii*, and also *Chara fragilis* var. *Sturrockii*. Frederick Jansen Hanbury has, during the last twenty years, explored many parts of Scotland with excellent results, and in his beautiful monograph of the "British Hieracia" has described many of the species of that genus, in which Scotland is so peculiarly rich. The Rev. E. F. Linton and the Rev. W. R. Linton have also added much to our knowledge, not only of comital distribution, but also have specialised in those critical genera the hawkweeds and willows, and while they agree in materially reducing the number of the latter species, have freely added to the former. The Rev. E. S. Marshall has also been indefatigable in exploring various parts of Scotland, especially the mountainous portions of the Highlands, and has been successful, in company with Dr. Shoolbred, in adding *Carex echinorrhiza* to the British flora. The Rev. E. S. Marshall has also added *Ranunculus scoticus*, *Coehlearia micacea*, as well as some species of *Hieracium* and *Euphrasia*. Mr. Frederick Townsend, of Honington Hall, Warwickshire, has added *Euphrasia scottica*, and describes *E. foulaensis*, as well as having published details of the distribution of the genus recently monographed by Dr. Wettstein. Mr. W. H. Beeby has on two or three occasions visited the Shetland group, and published an interesting list of the plants observed in that remote group of islands. The discovery of *Hieracium zetlandicum* and some other forms is due to his energy.

Mr. J. Cosmo Melvill and Mr. Charles Bailey have both added considerably to the knowledge of plant-distribution in Scotland; the former re-found Don's *Triticum alpinum*. Mr. Grant, of Caithness, has been fortunate enough to discover *Carex salina* in that county, and Mr. Hart has gathered *Arabis alpina* in the Cuchallis in Skye; in 1888 the Rev. W. B. Boyd found a new *Sagina*, afterwards named *Boydii* by Dr. Buchanan White; Mr. Brebner, of Dundee, found *Schaenus ferrugineus* near Loch Tummel in 1884 (now, it is to be feared, extinct), and re-found *Carex ustulata* in 1885 in Glen Lyon. Mr. Arthur Bennett, although he has never visited Scotland, has, by his work on the "Topographical Side of Scottish Botany," not only given an impetus to the study, but has amassed a most valuable amount of material; while we are also indebted to the researches of Messrs. A. Somerville, J. McAndrew, P. Ewing, R. Barclay, S. MacVicar. Professor Scott Elliott, and others, besides such eminent bryologists as the Rev. J. Ferguson, of Brechin, Mr. H. N. Dixon, and Mr. Sturton; and, lastly, our great gratitude is due to Professor Traill, of Aberdeen, who has edited the botanical portion of the "Annals of Scottish Natural History" with exceptional ability, and has himself done good work in the field, besides compiling the various records of Scottish plants in such a manner as enables me to give their present census (page 286), so that we can say with some degree of confidence of how many species it is composed.

THE SCOTTISH SPECIES OF PLANTS

chiefly belong to the Scandinavian type, and are extremely interesting. No one county has them all, but the counties richest are Perth, Forfar, Aberdeen, and Inverness.

On the serpentine of Unst, in the Shetland group, is *Arenaria norvegica*, also found in Sutherland, and a form of *Cerastium arcticum*, both being found by young Edmondstone when a boy of 11; and these northern islands also have a hawkweed, *Hieracium zetlandicum*; the marshes near Thurso have a grass, *Deyeuxia strigosa*; the glacial clay near the river Thurso is one of the two stations known for the

Holy Grass; on the coast the beautiful little gem-like flowers of *Primula scotica* are locally frequent, and the eye-bright, *Euphrasia latifolia*, is found. Sutherland has a rich flora, as its fine mountains on the western side yield *Arenaria*

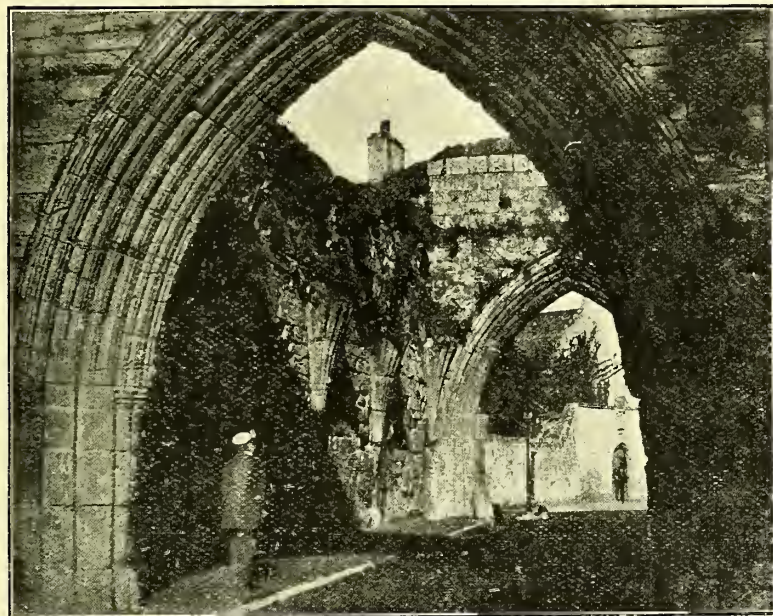
nivalis, *Arenaria suleata*, *Carex atrofusca*, and others. Perthshire also has the blue heath, *Phyllodoce taxifolia*, on the Sow of Athol, the yellow-flowered *Oxytropis campestris* near Loch Loch, and until recently in a marsh near Loch Tay a variety of *Dryas neglecta* named *borealis*, which I found in the eighties, and which is one of the most arctic forms known for Britain; Perth is also the home of *Potamogeton Sturrockii*, possesses the second locality for *Astragalus alpinus*, is the head centre of *Cochlearia micacea* and *Juncus biglumis*, and is the only known Scottish home for *Poa palustris*, *Sceluszeria*, and *Schœnus ferrugineus*, the two latter nearly, if not quite, extinct.

Argyllshire has some magnificent scenery, and one of its mountains, Ben Laigh, has many interesting species. On it, both in Perth and Argyll, I found a large-flowered form of *Arabis petraea* which I named *grandifolia*; it is allied to if not identical with var. *ambigua* of Fries. The mountain is also rich in hawkweeds and ferns.

Ayrshire has had *Botrychium matricariaefolium* recorded for it, as well as a peculiar variety of *Veronica officinalis*.

The coast of Wigtown has *Ononis reclinata*, but possibly introduced; *Atriplex calotheca*, the identity of which is not certainly ascertained; and Wigtown is the county from whence I first described the variety *hians* of *Melampyrum pratense*.

The county in which we meet comes in the first rank for the number of typical plants which it contains. It was the only home for the alpine cotton-grass. The cliffs of Glen Dole give a list of plants scarcely inferior to Ben Lawers, including *Astragalus alpinus*, *Oxytropis campestris*, *Lactuca alpina*, *Carex rupestris*, and *C. alpina*—plants which are absent from the Perthshire hills. The quartz-veined rocks of Canlochen are scarcely less rich, and they have *Gentiana nivalis* also. The table-land above these glens is the headquarters of *Carex rariflora* and the alpine forms of *C. aquatilis*. It is indeed a pleasure to wander over this elevated table-land 3,000 feet above sea-level and to see grow-



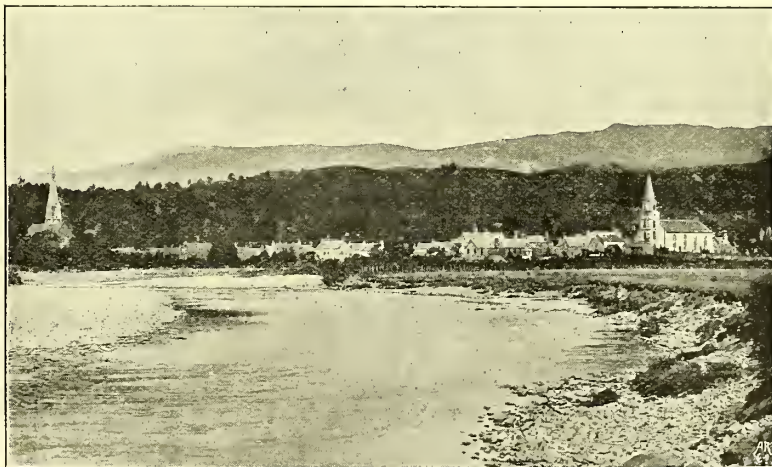
ENTRANCE TO ABBEY, ST. ANDREWS, LOOKING TOWARDS GREGORY'S GREEN (COMMONLY CALLED THE PENDS).

suleata and *A. norvegiae*, and its marshes give the only known British locality for *Carex chordorrhiza*.

The island of Skye is the only known Scottish home for the pipewort, *Eriocaulon*, which grows in the shallow margin of lochs; and the precipitous Cuchullins is the only British habitat for *Arabis alpina*.

Ross-shire yields a variety of *Agrostis canina*, var. *scotica*, which I discovered on Ben Eay, and it is the head centre of *Aretostaphylos alpina*; and a bog in the Black Isle is the only known station for *Pinguicula alpina*. The great county of Inverness contains the highest mountain—Ben Nevis—and there are extensive marshes and beautiful streams and lochs. It is the head centre of *Saxifraga rivularis*, which grows at the base of the steepest and most elevated cliffs, and of *Cerastium trigynum*; it is the only Scottish home for *Carex fusca*, and one of the three counties which yield *Carex approximata*. On the river-banks at Beaulieu I gathered for the second British station *Carex salina*.

Elgin and Nairn have those Scottish varieties the lovely *Linnæa borealis* and *Moneses uniflora*. Aberdeenshire with its splendid mountains—Ben Macdhui being only second to Ben Nevis in altitude—is the headquarters of *Luzula arcuata*; it also has the only known locality for the true *Poa scotica* (*P. laxa*), *Sagina Boydii*, and *S. alpina*; and it shares with one or two counties only in affording localities for *Gnaphalium norvegicum*, *Lactuca alpina*, *Erigeron alpinus*, *Salix lanata*, *Carex belvola*, *C. approximata*, *C. alpina*, *C. Sadleri*, and *Astragalus alpinus*. Perthshire, with its classic Ben Lawers, on which something like thirty of the plants peculiar to Scotland can be gathered, has two especially interesting species in *Saxifraga cernua* and *S. decipiens* (the latter of which I added to the Scottish flora in the eighties), *Myosotis alpestris*, *Erophila inflata*, *Draba rupestris*, *Sagina nivalis*, *Gentiana*



A GLIMPSE OF COMRIE.

Photo by Valentine & Sons (Limited).

ing by the mountain rills such plants as *Alopecurus alpinus*, *Phleum alpinum*, and *Sagina Linnæi* with its tiny stars of blossoms, or to traverse the Little Culrannoch to see the rosy spikes of *Lychnis alpina* in its only Scottish home. Then as a complete change we may investigate the rich

aquatic vegetation of Rescobie and Restennet to see in one of its few localities the submerged flowers like pearls of the *Ranunculus divaricatus* var. *aspergillifolius*, or the introduced water-soldier *Stratiotes*, or the poisonous *Cicuta*, which is said to lose its poisonous qualities near Edinburgh. The coast with bold cliffs near Montrose is adorned with the beautiful wood-vetch and the purple milk-vetch, and the shingle here and there shows the beautiful blossoms and foliage of the oyster-plant, while on the rich arenaceous tract of the Sands of Barrie *Juncus balticus* and *Carex inurea* grow, and an excessively rare form of the moonwort was once found. At Lunan Bay I also discovered for the first time in Scotland a specimen of the Kamskatchan wormwood, *Artemisia Stelleriana*, which probably had been brought by birds from Scania, where it is plentiful as a coast-plant. Thirty-six of the plants peculiar to Scotland are found in Forfarshire, exclusive of the *Hieracia*, which are also richly represented.

The Scottish flora, as at present known, numbers:—

Natives and denizens	...	...	1,205
Aliens, introductions, and casuals	...	...	285
Total	...	...	1,490 species

The whole of the British species number over 2,000, so that Scotland has practically three-fourths of the plants known to grow in the British Isles. In addition, there are about forty other species awaiting verification since the records are made on unsatisfactory evidence. Over sixty other species have also been recorded, but it is to be feared in every instance erroneously, and two or three are now probably extinct. The plants peculiar to Scotland are not so numerous as would at first sight be supposed. About eighty only do not reach as far south as England or west to Ireland; and, besides these, about fifty-seven species, or so-called species, of hawkweeds are also apparently limited to Scotland; but there is great probability that some of these will be found to extend to England or Ireland.

Species Peculiar to Scotland.

Thalictrum Kochii	Betula intermedia
Ranunculus scoticus (? in Ireland)	Salix lanata
Draba rupestris	S. Myrsinites
Arabis alpina (Isle of Skye)	S. Arbuscula
Cochlearia groenlandica	S. reticulata
Erophila inflata	Pinus sylvestris
Cerastium trigynum	Polygonatum verticillatum
Arenaria sulcata	Juncus trifidus
A. norvegica	J. castaneus
Cerberia sedoides	J. biglumis
Sagina Boydii	J. alpinus
S. nivalis	J. balticus
S. Linnæi	Luzula (Juncoides) arcuata
Lupinus nootkatensis	Potamogeton Sturrockii
Astragalus alpinus	Eriophorum alpinum (extinct)
Oxytropis uralensis	Carex rupestris
O. campestris	C. belvola
Lathyrus niger	C. approximata
Potentilla Sibbaldi	C. alpina
Pyrus pinnatifida	C. salina var. kattegatensis
Saxifraga cernua	C. rariflora
S. rivularis	C. vaginata
Erigeron alpinus	C. atrofusca
Gnaphalium supinum	C. Sadleri
G. norvegicum	C. saxatilis
Lactuca alpina	C. chordorrhiza
Arctostaphylos alpina	Hierochloa borealis
Loiseleuria procumbens	Deyeuxia strigosa
Phyllodoce taxifolia	Putum alpinum
Ledum palustre (doubtfully native)	Alopecurus alpinus
Moneses grandifolia	Poa scotica (P. laxa)
Primula scotica	Athyrium flexile
Gentiana nivalis	A. alpestre
Veronica alpina	Botrychium matricariæfolium
V. fruticans	Hieracium alpinum, L.
Euphrasia scotica	H. eximium, Backh.
E. foulaensis	H. calenduliflorum, Backh.
E. latifolia	H. graniticolum, W. R. Linton
Rhinanthus monticola	H. globosum, Backh.
R. borealis	H. gracilentum, Backh.
Orobanchæ cruenta (?)	H. petiolatum, Elfst.
Pinguicula alpina	H. atratum, Fr. f.
Atriplex calotheca (?)	H. curvatum, Elfst.
Betula nana	H. Backhousei, F. J. H.
	H. lingulatum, Backh.
	H. senescens, Backh.

Hieracium Marshalli, Linton
H. sinuans, F. J. H.
H. centripetale, F. J. H.
H. submurorum, Lindeb.
H. hyperarcticum, F. J. H.
H. callistophyllum, F. J. H.
H. cerinthiforme, Backh.
H. breadalbanense, F. J. H.
H. langwellense, F. J. H.
H. clovense, Linton
H. Carenorum, F. J. H.
H. eustales, Linton
H. proximum, F. J. H.
H. caledonicum, F. J. H.
H. oreades, Fr.
H. pseudo-onosmoides, Dahlst
H. nitidum, Backh.
H. buglossoides, Arv. Touv.
H. stenolepis var. anguinum, Linton
H. aggregatum, Backh.
H. pictorum, Linton

Hieracium rivale, F. J. H.
H. pollinarium, F. J. H.
H. orcadense, W. R. L.
H. rubiginosum, F. J. H.
H. duplicatum, Alm.
H. insulare, F. J. H.
H. cæcio-murorum, Lindeb.
H. orarium, Lindeb.
H. duriceps, F. J. H.
H. porrigens, Alm.
H. rhomboides, Stenst.
H. stenophyes, W. R. L.
H. subanfractum, Marshall
H. angustatum, Lindeb.
H. subramosum, Lonn.
H. diaphanoides, Lindeb.
H. lapponicum, Fr.
H. zelandicum, Beeby
H. truncatum, Lindeb.
H. dovense, Fr.
H. Dewari, Syme
H. Borreri, Syme

Two Plants are only found in Scotland and Ireland.

Eriocaulon septangulare | Carex fusca

FAUNAL AND FLORAL CONTRASTS.

The contrast between the floral and the human inhabitants of Scotland is strongly marked. The latter can successfully establish themselves not only in Britain, but they form the best colonists the world has ever known. It is not so with the Scottish group of alpine plants. Although it is true that some species of the Scandinavian type are enabled to settle themselves on the mountains of Northern England or Wales, and a still smaller number in Ireland, yet they are comparatively few, and in individual members there is a striking diminution. On the contrary, while Englishmen do poorly north of the Tweed, the plants from Southern Britain extend year by year their northern and western boundary. Railways and agriculture, and even manufacturing and mining operations, assist in this distribution, and this is evidenced by the large number of alien species recorded for Scotland; and a considerable percentage even of those classed as natives or denizens have no very satisfactory claims to be considered as constituents of the aboriginal flora, however naturalised they are now.

With such a large proportion of species recorded, and such an accumulation of knowledge about them as exists, the question may be asked, "Is there any reason why further attention should be given to a subject which is practically exhausted?—at any rate, of what use is it to the pharmacist?" To this I may reply that the subject is not worked out. It is true that the comital distribution of species is assuming some degree of completeness, yet how little is known of the geographical or altitudinal range of the minor forms and varieties, and how much it is to be desired that the plants themselves should be carefully correlated with continental forms. Even now more than half the counties of Britain possess no published flora, and their preparation now requires a very much increased labour than was formerly the case. The wide extent of research which plant ecology demands is scarcely as yet brought into the range of our vision, or what is seen is through a glass darkly, so that in this department of science, as yet only in its initial stages, any one of you can bring his quatum of assistance. The curious and suggestive instances of plant-association—that is, the occurrence in many stations of two or more species together, evincing as it does a mutual preference—is a subject which attracted one of your brilliant Scottish students, and it deserves and requires a more complete attention than it has yet received. The scientific exploration of the large pieces of inland water, such as your beautiful lochs, on the same lines as our Swiss and continental *confrères* have worked upon, should be speedily undertaken.

THE PLEASURES OF FIELD-BOTANY.

It has been somewhat the fashion in certain quarters to depreciate, if not to sneer at, field-botany; but one may be quite sure that there is little justification for this treatment. There is ample room for the laboratory-teacher, who has not only done so much to investigate plant-structure, and has so successfully demonstrated the unity of organic life, but has converted one side of the science into an excellent

subject for a professorial course of teaching; and there is full scope for the field botanist—he who comes face to face with Nature in her ever-changing moods, and is able to realise her enormous power of accommodating herself to environment. He is able to appreciate not so much, perhaps, the wind being tempered to the shorn lamb, but how the latter is able to accommodate itself to changed conditions. He notices the various modifications leaf-form assumes under varying conditions—the development of parenchymatous tissue in moist shady situations, and the shrinkage of it in exposed and dry places. He observes that under certain conditions seed-bearing becomes rare or absent, as in such instances as the elm, which propagates itself so readily by suckers, in the sweet flag by the creeping rhizome, or by the rooting stem as in the creeping jenny, and by the disarticulation of the leaflets in the lady's smock. He is able to explain the advance over Britain of certain continental species, such as *Crepis taraxacifolia*, whose feathery fruits are carried on Nature's chariot far and wide; and by the same powerful agent little parachute-like fruits of sea thrift are carried from the coast to the summit of the highest mountains, where they find a home—not, it is true, by the salt sea-foam, but on the rocky cliffs, where, meeting a constantly moist atmosphere and an absence of competing vegetation, they only greet the waves of wind and mist which surge over them from time to time. He is able to suggest in a way no mere arm-chair or laboratory botanist can, on seeing a piece of ground, what species are likely to grow there, and of what soil the ground is composed, and he is able to estimate with considerable accuracy whether they are native or introduced species which grow there. He is also cognisant of the important influence which a more rapid means of locomotion has exerted on plant-distribution—for instance, the spread of the little toad-flax (*Linaria viscaria*) along the iron road—so that, although probably of Eastern origin, it has spread over Britain, and its tiny blossoms have even been seen on the permanent way in lonely Glen Lyon or western Strath Carron; and he is able to realise the agency of birds in conveying to distant lochs or lonely mountain meres aquatic and other plants, such as the Canadian water-thyme; so that we are not dependent upon geological causes alone to account for the similarity of the vegetation of two opposite coasts when in the winds, waves, or by means of birds, seeds or plants may be quickly transported from one to the other.

Referring once again to Professor Bentley's address, we agree with his assertion that to the pharmacist the study of botany is strongly to be recommended, not so much as an examination subject, because now it is but little more than a mental training, and has lost touch of the practical side; but the subject having been practically abolished from the medical curriculum it behoves us to fill the place which was so worthily held by the apothecaries of old, since to them in large measure the progress of botany is due—and especially as those who legislate, and those who should initiate legislation, appear to be at one in giving us plenty of enforced leisure by permitting not only our business to be absorbed, but the titles which have been obtained by study to be taken from us by people who have not a shadow of right to adopt them. (Applause.) Like the apothecaries of old, we live straitened lives, but we can increase their brightness by pursuing in our leisure hours a science such as the one I have discussed; and by recording such interesting facts as Nature from time to time may reveal to us, we may do something to explore a small portion of that vast forest of the unknown by which even in the twentieth century we are surrounded, or lighten to some extent the gloom of ignorance which enshrouds some of Nature's problems, and which even the rays of the electric light have not at present illuminated. (Great applause.)

Tuesday's Proceedings.

[Continued from page 277.]

Principal Mackay continuing his remarks said: It seems to me particularly appropriate that this Conference should meet within this college. While the College busies itself with every branch of education there is no doubt that medical education is one of the most important parts of its work, and I may say the work of the Pharmaceutical Society is one which goes forward hand-in-hand with that of the medical profession. (Applause.) Their work is so closely allied that it is impossible but to see that without one another they could not succeed. The work of your Society is, I think, specially threefold. You are specially associated with the effort to improve the education of those who have the compounding and sale of medicines in their hand. Now such an effort is of the very greatest value, not only to the medical profession but to the whole community, and there is no thoughtful man who will not admit that the work done by the Conference is of the very highest value and deserves the most hearty recognition. (Applause.) Again, you are specially associated with the effort to improve the quality of drugs and the methods of their compounding, and those who are specially cognisant of the subject know that recent years have witnessed an improvement which is in all respects remarkable. It is now possible to keep the most delicate compounds practically without change for many years, and the help that has been to the profession is also worthy of recognition. Also, you are specially associated with the effort to improve our knowledge as to the action of various drugs, and in that matter I may say we in this college, many of us, are working on parallel lines with the Society, practically hand in hand. Professors of physiology, materia medica, and pathology are all directly associated with the work you are doing. I think you will find that the volume of work going forward from this college equal to any other learned institution in the country. It is because the Conference engages in this work in association with the College, and these bodies are so closely related with one another, that I, on behalf of all my colleagues, wish you a hearty welcome here, trust the Conference may be successful in all parts of its work, and ask and earnestly invite you to return soon again to Dundee. (Loud applause.)

The PRESIDENT expressed the extreme gratitude of the members of the Conference for the very kind words of welcome which Principal Mackay had extended to them. It was true, as he had said, that in many ways the Conference worked on similar lines to that of University College. They rejoiced to see the way in which technical education was extending in Scotland, and the way it was taught in that college reflected the greatest credit upon the governing body of the College. He expressed the feeling of the Conference in offering their thanks to Principal Mackay, not only for letting them have the use of that building, so admirably fitted for their meetings, but also for the cordial welcome he had offered them that day. (Applause.)

Mr. DRUCE then proceeded to deliver his address, which is printed on pages 278 to 287, taking exactly fifty minutes for it. At the conclusion of the address, Mr. S. R. ATKINS moved a

VOTE OF THANKS.

Mr. S. R. ATKINS said it was a happy coincidence that they should that day have a botanist in the chair. When the Conference met in Dundee in 1867, Professor Bentley, the distinguished botanist, was in the chair. In true apostolic succession their President that day was certainly the proper man to fill the chair. The President was not only an enthusiast, he was a specialist. It had been said that specialists are narrow; but (continued Mr. Atkins) Mr. Druce is far from that: he takes the entire world for his guide. He is an enthusiast in botany who roams all over the country seeking fresh specimens, and with the unerring instinct of genius appears to hit on the exact spots in the glens and on the mountain sides where the plant he seeks is to be found. Mr. Druce is not only a man of science, he is also a humourist. (Applause.) He is the master of refined persiflage. He has the merit of saying the graceful thing, especially concerning ladies—(laughter)—in the best way. He (the speaker) was

much interested in the masterly sketch of that great Scotchman, Don, who was only a type of many of the great men born and bred north of the Tweed. (Applause.)

Mr. CHARLES KERR, in seconding, likewise acknowledged the marked ability shown in Mr. Druce's address. He thought all would gain much knowledge and profit from what he had said. He (Mr. Kerr) was particularly interested, seeing that he was a native of Forfar and knew the localities referred to by Mr. Druce very well. He hoped their President would long be spared to wander round with so much profit to botany amongst their beautiful hills and glens. (Loud and long-continued applause.)

The PRESIDENT, having acknowledged the thanks in a few words, said that a cablegram had been received from Professor Remington, of Philadelphia, wishing the Conference "Hearty Greetings."

Mr. F. RANSOM (Hon. Secretary) intimated that he had received

LETTERS OF REGRET

from Dr. Attfield, Dr. Symes, Dr. Jowett, Professor Geddes, Mr. G. D. Beggs (President of the Pharmaceutical Society of Ireland), Sir Thomas Robinson, Messrs. E. M. Holmes, H. Wippell Gadd, E. H. Farr, R. C. Cowley, T. Bateson, R. Wright, J. L. Ewing, Leo Atkinson, T. H. W. Idris, F. B. Bengier, J. Davy Turney, H. Kemp, T. Donald Watson, and Charles Umney. The letter from Dr. Attfield said:—

Ill-health alone prevents me joining in Pharmaceutical Conference this year at Dundee. The welcome to that city will be as warm evidently as it was in 1867. The subjects to be considered have great interest for me; the discussions are always enlightening; the address is sure to be good. Then there will be the cheerful gossip, the kindly festivities, the renewal of friendships, and the delightful contemplation of the glories of Nature. How I shall miss them all! Alas! miss also departed friends and companions. The eleventh of the twenty-four past Presidents, I am now the senior one living—for how long, I wonder? But the retrospect is gratifying. Since a few of us founded the Conference forty years ago save one, that body has contributed nearly a thousand original researches to pharmacy, while socially the Conference has done much towards removing the jealousies and towards promoting the esteem and respect for each other of pharmacists throughout the United Kingdom. How richly it merits the sympathy and support of every one of our followers of the pharmaceutical calling.

Mr. F. RANSOM next read the following list of

DELEGATES.

Pharmaceutical Society of Great Britain.—The President, Vice-President, Treasurer, Messrs. Cooper, Gifford, Harrison, Southall, Storror, Symes, and R. Brembridge (Secretary).

Pharmaceutical Society of Great Britain (North British Branch).—The Chairman and Vice-Chairman, and Messrs. William Beaverly Cowie, Edinburgh; Wm. Cummings, Dundee; David Brown Dott, Edinburgh; Thomas Dunlop, Glasgow; John Henthison Fisher, Dunfermline; James Pinkerton Gilmour, Glasgow; Claude Francis Henry, Edinburgh; John Johnston, Aberdeen; Charles Kerr, Dundee; Thomas Mabon, Glasgow; Donald Mitchell, Inverness; Andrew Naysmith, Arbroath; James Nesbit, Portobello; Alexander Spence, Linlithgow; David Storror, Kirkealdy; Alexander Strachan, Aberdeen; and John Tocher, Dumfries.

Pharmaceutical Society of Ireland.—Mr. G. D. Beggs (President), Mr. J. I. Bernard (Vice-President), Mr. P. Kelly, Mr. J. Smith.

Brighton Association of Pharmacy.—Mr. Charles G. Yates and Mr. W. W. Savage.

Bristol Pharmaceutical Association.—Mr. E. F. Young (President), Mr. G. T. Turner (Vice-President), Mr. J. W. White (President-elect), Mr. H. E. Boone (Hon. Secretary).

Cambridge Pharmaceutical Association.—Messrs. E. H. Church and E. S. Peck.

Dover Chemists' Association.—Mr. R. M. Ewell.

Edinburgh Chemists', Assistants', and Apprentices' Association.—Messrs. W. B. Cowie, Wm. Duncan, J. Rutherford Hill, Albert E. Kelly.

Forfarshire and District Chemists' Association.—Messrs. A. B. Anderson, John Anderson, Charles Cummings, William Doig, D. H. Ferrier, John Gray, John Hardie, John Hodge, Chas. Kerr, William Ramsay, James Russell, John W. Russell, William Park, Dundee; E. Fleming, Broughty Ferry; A. Naysmith, J. Jack, Arbroath; T. S. Peebles, J. H. Thomson, Lochee; A. Davidson, Montrose; T. Harley, Perth; W. R. Kermath, St. Andrews; Miss Ford, Mr. James Ford, Kirriemuir.

Glasgow and West of Scotland Pharmaceutical Association.—

W. L. Currie (President), T. Dunlop (Secretary), Messrs. Arthur, Brodie, Riddell, Sutherland.

Grimsby and District Chemists' and Druggists' Association.—Mr. R. Cook, J.P. (President), Mr. H. W. Colley (Hon. Secretary).

North-East Lancashire Chemists' Association.—Mr. Councillor R. Shorrocks.

London Western Chemists' Association.—Mr. J. W. Bowen (Vice-President), Messrs. W. P. Robinson, F. A. Rogers.

London Chemists' Assistants' and Apprentices' Association.—Messrs. W. Garsed, C. J. Strother.

Manchester Pharmaceutical Association.—Messrs. Grier, Johnstone, Kemp, Kidd, Kirkby, Pidd.

Newcastle-on-Tyne and District Chemists' Association.—Messrs. George Foggan, G. F. Merson, T. Maltby Clague, J. D. Rose.

Nottingham and Notts Chemists' Association.—Mr. A. R. Bennet, F.C.S.

Oxford and District Chemists' Association.—Messrs. G. C. Druce, M.A., and H. Mathews.

Plymouth, Devonport, Stonehouse, and District Chemists' Association.—Mr. C. J. Park.

Sheffield Pharmaceutical and Chemical Society.—Messrs. A. R. Fox, F.L.S., G. Squire, G. T. W. Newsholme, F.C.S.

Chemists' and Druggists' Association of Ireland.—Messrs. Gibson and Rankin.

Mr. E. S. PECK, on rising to read the

REPORT OF THE EXECUTIVE COMMITTEE,

was received with hearty applause, this being his first appearance in the capacity of Hon. Secretary. The report was as follows:—

The Executive Committee beg leave to report to the members of the Conference that they have met in London upon four different occasions, at which a large proportion of the members were present.

Since the last annual meeting fifty-one candidates have been elected to membership, thirty-seven members have resigned, and ten have been removed by death. Among the latter special mention must be made of the following: Mr. Wm Martindale, who was President of the Conference at Cardiff in 1891, and at Liverpool in 1896, and a frequent attendee at other annual meetings. He was Chairman of the Reception Committee when the Conference met in London in 1900. As Chairman of the Formulary Committee for many years he rendered invaluable services, and generously placed at its disposal his exceptional experience in this direction. The *Year-books* of the Conference contain many original researches in pharmacy by him. The committee feel that in him they have lost a brilliant and particularly accurate and conscientious scholar, and a loyal and active worker.

Mr. T. B. Groves, of Weymouth, who was President of the Conference at London in 1874 and Bristol in 1875, and of whom it has been said "he was one of the most accomplished men who have shed lustre upon the annals of British pharmacy."

The death also of Mr. Louis Siebold, late Editor of the *Year-book*, whose resignation through ill health was specially drawn attention to in the last annual report, is now recorded with profound regret.

Mr. John Johnston, sen., of Aberdeen, has passed away during last month. He took a keen interest in pharmaceutical affairs, and was much respected and esteemed by all who met him at the many meetings of the Conference that he attended.

The research-list has been again revised by a sub-committee appointed for the purpose. Several deletions of subjects recently worked out were made, whilst other items were added.

The committee wish to draw special attention to the fact that a considerable sum of money is available for the purposes of research, and they would heartily welcome applications for grants.

Your committee wish to thank the various local corresponding secretaries for the help they have rendered in collecting and forwarding subscriptions from members in arrears and otherwise assisting in keeping the list of members fairly accurate.

The committee would be glad to receive the names of members willing to serve as local corresponding secretaries in those towns where at the present no one is acting in that capacity. They feel that this would be one means of considerably increasing the membership of the Conference.

Your committee also desire to tender their hearty thanks to the Pharmaceutical Society of Great Britain for their kindness in granting them the use of a room for their meetings at 16 Bloomsbury Square, London.

The following have been duly elected honorary members of the Conference, and have written expressing their thanks: Mr. C. R. Blackett, President of the Pharmacy Board, Melbourne; Professor Ladenburg, of the University of Breslau; Mr. J. H. Maiden, Director of the Botanic Gardens, Sydney; Dr. David Prain, Director of the Botanical Survey, Calcutta; and Professor Prescott, of the University of Michigan, Ann Arbor, U.S.A.

Mr. W. T. Grice, F.C.S., of Calcutta, has been appointed colonial secretary for Bengal.

Mr. J. O. Braithwaite, the editor of the *Year-book*, reports that good progress is being made, and that the MSS. of Parts 1 and 3 are already in the hands of the printers.

The PRESIDENT, speaking on the report, referred particularly to the deaths of Mr. William Martindale and Mr. Thomas B. Groves. These men, he said, had done enormous work for pharmacy. The work compiled by Mr. Martindale in his well-known book, and the kindly, warm-hearted, and generous help he extended to all pharmacists, will never be forgotten. The classic researches on aconite made by Mr. Groves always appeared to him (the President) to indicate the high-water mark of good pharmacy. The practices of the present day appear to contemplate a crushing out of such work. The growth of joint-stock companies, spreading like gigantic upas-trees, and the development of gigantic trusts seem to be having a deadly influence on the pharmacy of modern times. He recalled the kindly touch in the letter of congratulation sent by Mr. Groves to the Conference at Dublin last year.

Mr. N. H. MARTIN, moving the adoption of the report, said the work of the Executive during the past year had on the whole been satisfactory. A note of sadness was prevalent, made more poignant from the character and calibre of the men whom they had lost. The work of Mr. Groves would live as long as pharmacy existed. They were well acquainted with the good work and charming personality of Dr. Louis Siebold, and the excellent pharmaceutical work done by Mr. Johnston, but the greatest and most deplorable loss was that of Mr. Martindale. He (the speaker) knew him well in working along with him in the preparation of the *Formulary*, and though the work he had done in his lifetime was colossal they had hoped it was only an earnest of greater things to follow. All pharmacists must deplore the death of Mr. Martindale. It was a matter for regret that the considerable sum of money for research-work had not been applied for. He thought some of the younger members ought to apply for grants.

Mr. J. C. C. PAYNE seconded.

Mr. ATKINS desired to support the motion in order that he might say a word about his old friend Mr. Groves. He and Mr. Groves had been friends from boyhood; they were apprenticed together in the same town, and had kept in touch with each other all through life, and through the death of Tom Groves—as he was affectionately called—he had lost one of his most cherished friends. Mr. Groves was one of that body of men who constituted the *renaissance* of pharmacy. It would be invidious to mention names, but he thought men like Schacht, Reynolds, Brady, Stoddart, and Groves, besides a galaxy of stars, deserved recognition as members of that body. Mr. Groves was a true man, a keen observer, an accurate thinker, and a patient worker. In his pharmacy everything was of the best, and his work will stand the test of time, and it will be work for further research. But Groves was more than a pharmacist and a chemist: he was an archaeologist and antiquary of repute. His work in connection with the archaeology of Dorsetshire will live, and it is recorded that the Rev. Mr. Moule, brother of the Bishop of Durham, and a well-known antiquary, only undertook his great work on Dorsetshire archaeology on condition "that he had the assistance of the two distinguished antiquaries, Groves and Barrett." (Applause.)

Mr. J. C. UMNEY (Treasurer) was called upon to submit the

FINANCIAL STATEMENT,

which had previously been circulated, and which is given in abstract in the next column.

Mr. UMNEY said the position of the Conference was, briefly—it is 50% in debt, owing to expenditure on the *Formulary*. Next year by this time he hoped that they would be out of debt. He called attention to the 47l. 15s. lying useless in the Research Fund unless workers took some of it out to help them in their researches. He had been looking at the statement submitted to the Conference in 1867, and there found two things which he desired to call attention to: first, that a donation to the Conference funds had been received from the Pharmaceutical Society, which does not appear now—(laughter)—and the other was a list of unpaid subscriptions, which, he regretted to say, still obtained, but he trusted that by next year the Assistant Secretary would have a better report to make on that point.

Income.			Expenditure.		
	£	s. d.		£	s. d.
Assets from last year ...	21	14 4	Bell and Hills Fund from last year ...	28	11 9
<i>Year-book</i> sales ...	24	14 2	<i>Year-book</i> expenses (including 100l. Editor's salary) ...	334	6 4
Advertisements ...	67	18 6	Formulary expenses ...	44	18 5
Formulary sales ...	14	0 0	Sundry expenses ...	11	11 6
Members' subscriptions ...	350	13 3	Assistant-Secretary's salary and rent ...	55	0 0
Liabilities ...	55	8 4	Postages ...	14	11 6
Bell and Hills Fund ...	27	18 8	Printing and stationery... ..	10	4 0
Realised assets ...	96	4 1	Petty cash ...	11	1 6
			Bank charges, 1d., commission on postal orders, 3d.	0	0 4
			Liabilities of last year since paid ...	137	11 6
			Foreign journals for Editor ...	4	14 10
			Balance at bank ...	5	19 8
	£658	11 4		£658	11 4

The Bell and Hills Fund showed a balance of 28l. 11s. 9d. from last year and an income of 9l. 6s. 8d. from Consols, with expenditure of 9l. 19s. 9d. on books.

On the motion of Mr. GERRARD, seconded by Mr. RUTHERFORD HILL, the statement was adopted.

Mr. N. H. MARTIN was next called upon to read the following report of the

FORMULARY COMMITTEE.

At the last meeting of the Conference in Dublin the Formulary Committee reported the publication of a new edition of the *Formulary*. Since then a steady demand for the book has been maintained, and the sum of 14l. realised from the sales of it. This is quite satisfactory, and may be accepted as indicating that the number of prescribers who accept the B.P.C. *Formulary* as the standard for the preparations contained in it is on the increase. There are still some copies on hand at the printers', but it is time to consider seriously the question of the early revision of the book, with such alterations and additions as may be necessary, and in this connection the committee is much disappointed that no notice has been taken of the request in the last report that members of the Conference should send to the Secretary or to any member of the Formulary Committee a list of all preparations, for which there was no formula in the *Pharmacopœia* or the *Formulary*. There must be a considerable number of such preparations which do not come under the personal experience of the dozen members of the committee, and it is only by every member of the Conference acquainting the committee wherein he has found the *Formulary* wanting that it can be made as complete as is desirable. The committee hopes that this reminder will have the effect of inducing members of the Conference to send in with as little delay as possible the material for compiling such a list as will enable the committee, if reappointed, to give early consideration to whatever revisional or supplementary work on the subject may be found necessary.

The report was adopted without comment, and the

READING OF PAPERS

was commenced exactly at 11.54, the first taken being

Alkaloidal Stability of Certain Standardised Preparations of the *Pharmacopœia*.

By W. A. H. NAYLOR, F.I.C., F.C.S., and C. HUXTABLE.

Various statements have been made from time to time concerning the variation in alkaloidal content of standardised preparations, due to the length of time that they have been kept in stock.

Liquid extract of ipecacuanha is a preparation about which much diversity of opinion exists. R. Glode Guyer (*P. J.*, 4, ix., page 622) affirms that a reduction in the strength of the liquid extract takes place after being kept in stock for two months. He indicates a diminution of 0.552 per cent.—viz., from 2.08 to 1.528 per cent. This corresponds to a loss of 26.53 per cent. on the amount of alkaloid originally present. But a paragraph in the same journal (4, ix., page 633) stated that a sample of liquid extract which had been kept in stock for eighteen months remained still bright, and contained the full amount of alkaloid. I. W. Thomson has noted that a laboratory sample of a 12-gal. lot made six months previously showed no signs of deterioration. J. C.

Umney states that deterioration takes place in the alkaloidal value of the liquid extract, and even more deterioration in the wine (*P. J.*, 4, x., page 8). Farr and Wright in their "Note on the Stability of Alkaloidal Tinctures" (*Year-book of Pharmacy*, 1894, page 344) show that an appreciable loss of alkaloid is noticeable in tincture of cinchona.

These conflicting statements induced the authors to make a series of determinations of liquid extract of ipecacuanha and certain other standardised preparations.

The preparations they have examined are (*a*) liquid extract of cinchona, (*b*) tincture of cinchona, (*c*) compound tincture of cinchona, (*d*) liquid extract of ipecacuanha, and (*e*) liquid extract of nux vomica.

The respective samples were taken from large batches which had been recently made. They were kept under observation from November, 1901, until July, 1902, requisite quantities being assayed at intervals of one month. The samples were stored on a shelf in ordinary stoppered bottles, exposed to variations of light and temperature under exactly the conditions which would obtain in an ordinary pharmacy. The official processes of assay were employed, with the exception of liquid extract of ipecacuanha, where Naylor and Bryant's process was used. The following table shows the results obtained:—

	1901		1902						
	November	December	January	February	March	April	May	June	July
	Grams per 100 c.c.	Grams per 100 c.c.	Grams per 100 c.c.	Grams per 100 c.c.	Grams per 100 c.c.	Grams per 100 c.c.	Grams per 100 c.c.	Grams per 100 c.c.	Grams per 100 c.c.
Liquid extract of cinchona... ..	5.1	5.1	5.1	5.05	5.05	5.00	5.00	5.00	5.00
Tincture of cinchona	1.03	1.03	1.02	1.02	1.01	1.01	1.01	1.01	1.01
Compound tincture of cinchona ...	0.51	0.51	0.51	0.51	0.50	0.50	0.50	0.50	0.50
Liquid extract of ipecacuanha ...	2.10	2.10	2.05	2.04	2.02	2.00	2.00	2.00	1.98
Liquid extract of nux vomica ...	1.50	1.50	1.50	1.49	1.49	1.49	1.49	1.48	1.48

The total amount of alkaloids lost thus are 1.96 per cent. of the original amount of alkaloid present in the case of liquid extract of cinchona, 1.94 per cent. for tincture of cinchona, 1.96 per cent. for compound tincture of cinchona, 5.66 per cent. for liquid extract of ipecacuanha, and 1.33 per cent. for liquid extract of nux vomica.

The extreme limit of loss occurs with the extract of ipecacuanha (5.66 per cent.), but it does not confirm the 26.53 per cent. loss stated in Guyer's paper. The results of the cinchona-preparations show practically a constant quantity, but less than obtained by Farr and Wright.

These results show that, with keeping, a depreciation in alkaloidal value of these standardised galenical preparations occurs, although the amount is very small. Farr and Wright, in their comment on the loss of alkaloid in tincture of cinchona, explain that it is doubtless due to the mechanical carrying out of solution of traces of alkaloid by deposition of resinous and extractive matter, and the authors think this explanation holds good for other preparations, as in the case of extract of ipecacuanha, where the deposit is comparatively large and resinous in nature. The deposit from 200 c.c. of the liquid extract, which had been allowed to stand for nine months, yielded 0.008 gram of alkaloid. Examination of the deposits from the other preparations did not yield a weighable quantity. The indications are distinctly in favour of loss of alkaloid by precipitation, as opposed to loss of alkaloid by decomposition.

Mr. RANSOM then read, in the absence of the authors, the following:—

The Standardised Tinctures and Ipecacuanha-wine of the British Pharmacopœia.

A Report on the Strength of Commercial Samples.

By E. H. FARR, F.C.S., and R. WRIGHT, F.C.S., Pharmacists

In the year 1895 the authors obtained and examined a number of samples of the alkaloidal tinctures of the 1885 Pharmacopœia, and presented a report on the same to the Bournemouth Conference. The wide variation in the alkaloidal value of commercial samples shown in that report was held to constitute a powerful argument in favour of their standardisation. In the interval, the 1898 edition of the Pharmacopœia has been issued, and the list of standardised preparations extended; so the authors thought that the members of Conference would be interested in a further report on the subject, showing whether the improvement in the processes followed was reflected in the character of the resulting products as met with in pharmacy. For the purpose of the experiments samples were obtained from different parts of the United Kingdom, and examined as to (1) alkaloidal strength, (2) extractive value, and (3) specific gravity.

For the determination of the alkaloids the official processes were followed in all cases, but in the strychnine-

estimations a modification of the official process was employed based upon their note on the subject read at the London meeting of Conference in 1900. This consists in carrying out the precipitation of the strychnine at 70° F., and subsequently washing at 100° F., the necessary correction being made for strychnine lost in the process.

In the note referred to the authors showed that the official process is liable, under certain conditions, to give results much too high; and they attribute the low results obtained in the examination of the present series of nuxvomica tinctures to that fact.

The other tinctures did not call for special comment. One sample of belladonna was evidently a leaf-tincture, and in the case of two other tinctures it was quite evident no attempt at standardisation had been made.

The proportion of extractive was determined by the evaporation of a measured portion of the sample in a tared dish having a flat bottom, the extract being dried at 100° C. until the weight was constant.

As might be expected, the figures for extractive show a much greater variation than those for alkaloids; in fact, the yield of some tinctures was so high as to place them outside the limits laid down by various authorities on the subject.

Examination of the results shows that, although the standardisation of the preparations reported upon has not yet secured that uniformity in strength which is desirable, it has certainly effected an immense improvement in their character and potency.

TABLE I.
Showing the Amount of Alkaloids in Grains from 100 c.c. of Tincture.

Tincture	B.P. Standard	1	2	3	4	5	6	7	8	9	10	Variation 1885
Belladonna ...	C-48 to 0-052	0-045	0-052	0-046	0-046	0-045	0-044	0-044	0-026	0-044	0-040	0-008 to 0-031
Cinchona ...	0-95 " 1-05	1-00	0-82	1-00	1-16	0-53	0-90	0-35	1-02	1-01	0-93	C-2 " 1-18
Cinchona compound ...	C-45 " 0-55	0-61	0-45	0-41	0-20	0-52	0-31	0-49	0-54	0-50	0-58	—
Nux vomica ...	0-24 " 0-26	0-252	0-242	0-192	0-224	0-160	0-194	0-248	0-200	0-212	0-232	{ C-114 } Total to 0-224 } mixed alk.
Opium ...	0-70 " 0-30	0-71	0-33	0-76	0-77	0-35	0-39	0-67	0-70	0-74	0-76	
Ipecacuanha-wine ...	0-100 " 0-112	0-094	0-065	0-080	0-090	0-090	0-073	0-124	0-106	0-036	0-172	—

TABLE II.
Showing the Amount of Extract in Grains from 100 c.c. of Tincture (dried at 100° C.).

Tincture	Suggested Standard (Gadd)	1	2	3	4	5	6	7	8	9	10
Belladonna ...	0-5 to 2	1-188	0-748	0-728	1-156	0-916	0-852	0-750	1-10	0-950	1-05
Cinchona ...	4 " 7	6-23	5-65	6-07	8-88	4-50	6-54	6-95	8-80	9-50	5-50
Cinchona compound ...	4 " 6	5-21	5-42	3-78	2-85	5-20	4-30	6-00	5-35	5-05	5-50
Nux vomica ...	1 " 2	3-93	2-08	2-77	2-88	2-17	1-87	1-55	1-85	3-40	3-15
Opium ...	3 " 6	3-47	4-33	3-75	4-42	2-84	3-37	3-55	3-30	4-15	3-50
Ipecacuanha-wine ...	—	3-25	3-87	3-64	3-33	3-26	3-23	3-90	2-50	9-05	7-50

TABLE III.
The Sp. Gr. of the Tinctures at 63° F.

Tincture	Standards Proposed	1	2	3	4	5	6	7	8	9	10
Belladonna ...	0-912 to 0-918	0-930	0-920	0-918	0-918	0-918	0-917	0-911	0-941	0-915	0-915
Cinchona ...	0-916 " 0-920	0-923	0-934	0-912	0-931	0-928	0-926	0-915	0-925	0-925	0-914
Cinchona compound ...	0-912 " 0-918	0-920	0-920	0-935	0-904	0-909	0-915	0-914	0-925	0-924	0-920
Nux vomica ...	0-909 " 0-912	0-904	0-899	0-916	0-912	0-907	0-917	0-891	0-909	0-913	0-915
Opium ...	0-952 " 0-953	0-960	0-945	0-963	0-963	0-956	0-956	0-953	0-955	0-958	0-954
Ipecacuanha-wine ...	—	0-937	0-991	0-991	0-991	0-991	0-939	0-939	0-933	1-00	1-00

DISCUSSION.

Mr. BIRD said Mr. Naylor had carried on the experiments, which had never been done before, by examining from time to time the liquid extract of ipecacuanha so as to see what happened. His own experience confirmed Mr. Naylor's, and only last week he had made three analyses, which showed 0.1, 0.105, and 0.106 per cent. of alkaloid, thus indicating little deterioration. There were certainly cases in which, owing to the lime employed and consequent alkalinity of the extract, the latter containing free alkaloid, precipitated, but he also thought that decomposition took place. He desired to say a word with regard to judging galenical preparations by their extractive content. Owing to such factors being taken as a standard by analysts, it should not go forward with the sanction of that Conference that the extractive content suffices when the active principle can be determined. He had known a sample of tincture of digitalis being condemned because it did not contain a sufficient amount of extractive, although 3 per cent. was present.

Mr. J. C. UMNEY, as one of the originators of the B.P. process, said he had made a considerable number of experiments, and at first did not observe any deterioration in the extract; but during the past two years he had observed a considerable amount of depreciation—as much as 7 per cent. of the alkaloid present originally. The depreciation was greater in the wine, owing to precipitation. In one instance the liquid extract had suffered no change in three months, while another sample in the same time lost 7 per cent. of alkaloid, owing, as Mr. Bird had said, to alkalinity due to lime.

Mr. N. H. MARTIN said, as public analysts were exceedingly active, such papers as this did good, and the Conference was greatly indebted to the authors. It was really

very hard on the chemist that, after taking all care in making the preparation, he should suffer for keeping it on his shelf a reasonable time and it went just a little wrong there through no fault of his own. He (the speaker) still held the belief that what should be done was to standardize the crude drug, where that could be done on the basis of active constituents, and the preparations should not be highly concentrated, as such were apt to go wrong, but rather in dilute form. Before the next Pharmacopœia was issued it was exceedingly important that they should have a good body of information on this subject. (Applause.)

Mr. J. R. HILL said he had examined a sample of ipecacuanha-wine, and returned to it a year after, to find that it had lost 23 per cent. of its alkaloid. An important question in that regard was, What is sherry? If, continued Mr. Hill, amidst roars of laughter arising from his known anti-alcoholic views, I can judge from my experience throughout the country, pharmacists are not able to judge what a good sherry is, and I am of opinion that a good deal of trouble with ipecacuanha-wine depends on the nature of the sherry used.

Mr. WILLIAM MAIR, referring to Mr. Martin's remarks on concentration of vegetable preparations, said his objections could be met by not concentrating to the decomposition-point.

Mr. BIRD asked if Mr. Naylor had found the alkaloid in the deposit balance the loss from the solution.

Mr. T. MABEN asked if Mr. Naylor had determined the cause of the precipitation or the nature of the precipitate. He held similar views to Mr. Hill regarding sherry, for ipecacuanha-wine varies more than the liquid extract. He had heard the late Mr. Groves say that the better the sherry the worse was the ipecacuanha-wine, and he (Mr. Maben) was inclined to think that precipitation was due to tannin in the wine.

Dr. GEORGE COULL said two points had struck him. Since B.P. standardisation had put the making of their preparations into the hands of wholesalers he had noticed that extract of belladonna made by himself was lighter than that made by other people. That was an important point, and he thought the B.P. process should be adhered to. (Applause.) As regards ipecacuanha, he had noticed in recovering spirit from the marc that it had an odour of trimethylamine, which constituent might cause precipitation.

Mr. J. C. UMNEY said there was an enormous difference in the two belladonnas, and the English root gave the darker preparation when overheated. The presence of trimethylamine in the ipecacuanha percolate was noted in his original paper.

Mr. MABEN remarked that it might be inferred from what Mr. Umney said that Dr. Coull used foreign root. As to that, he knew one make in which only foreign root was used, there being insufficient of the English to supply the world, and that was a light preparation.

Mr. A. W. GERRARD said the result of the communications went to show that there was little deterioration in the preparations. Since his early days much progress had been made in this subject of alkaloidal preparations, and it was due to that Conference. (Hear, hear.) He thought the sherry question largely a matter of opinion, and the main point was standardisation as to alkaloid with freedom from alkali.

Mr. CHARLES KERR wished to emphasise one point. It was his custom to make his own tr. cinchonæ co., as it was largely used in Dundee, and he liked to give his assistants the opportunity of familiarising themselves with making galenicals. (Hear, hear.) Well, when the tincture goes into a mixture there is a big deposit. He liked to send out clear mixtures, but in this case, if the prescription had been dispensed before, he did not know what to do, which would not be the case if the first dispenser had marked the prescription "filter." That was the point he wished to make. (Hear, hear.)

Mr. WATSON-WILL said he was accustomed in making ipecacuanha-wine to first detannate the wine with hide powder. In his experience the resulting preparation kept well under all conditions.

The PRESIDENT, summing up the discussion, remarked that the authors of the papers showed that there was not much diminution of strength in the preparation. As to ipecacuanha, he said that in two instances he knew of the use of ipecacuanha had been given up altogether, and the persons made an acetous extract which they used instead, and it was a more powerful emetic. Whether the price had anything to do with it he did not know. The gentlemen who had prepared the papers were deserving of very warm thanks. (Applause.)

Mr. NAYLOR said they proposed to keep these preparations. They had only had them nine months, and they would be examined monthly for the next twelve months. He had been very much gratified with the discussion. There was one gentleman present who could tell them more on this subject than anyone else—Dr. Paul. (Applause.) He could enlighten them in regard to the question of decomposition. Reference had been made to the action of lime, which they knew under certain conditions had a destructive action upon one of the alkaloids of ipecacuanha, and he had a strong conviction that Dr. Paul could tell them whether there was any probability that liquid extract of ipecacuanha-wine, kept in the presence of what no doubt would be a very weak solution of lime, would be likely to decompose. He (Mr. Naylor) had also been asked if the amount of alkaloid found in the precipitate of ipecacuanha liquid extract made up for the deficiency, because if so there could not possibly have been any decomposition. That was a very difficult matter to determine, because it was almost impossible not to lose some of the alkaloid. How would they treat it so that they would not lose any at all, and be able to recover the whole of it? They had tried it in one case, but did not make up the balance. He was still strongly of opinion, and he thought probably that further experiments would confirm it, that decomposition did not take place to any serious extent at all in the keeping of these preparations over prolonged periods. (Applause.)

Dr. PAUL (who was received with hearty applause) said he thoroughly agreed with the conclusion Mr. Naylor had

come to both with regard to cinchona and ipecacuanha wine. There is practically no alteration if the preparations are properly made and properly kept. There must, however, be a reduction in the medicinal value of cinchona preparations. There is always a very large deposit, especially from the kind of bark used nowadays, and that was due to the alteration of that unknown quantity variously called extractive, or tannin, or kinovin. That deposit, so far as he had had an opportunity of examining it, contained very little alkaloid indeed. It, however, made a great show, which might lead to the supposition that the preparation had considerably altered; the quantity of alkaloid carried down was exceedingly small with cinchona and also with ipecacuanha. In his own laboratory he had some ipecacuanha-wine made two or three years ago which was now practically in the same condition as it then was. As to the probability of ipecacuanha preparations becoming altered, he had no doubt, if they were made in such a way as to throw alkalinity into the spirit or other medium, the alteration would be very rapid and very considerable, because spirituous solutions of cephaeline and emetine, if exposed to light, very rapidly went through an alteration which in time changed their character and destroyed their medicinal properties. They became yellow and very rapidly disappeared altogether after a very short period of time. With regard to ipecacuanha-wine, Dr. Wild had applied various physiological tests, and he and the speaker had come to the conclusion that all ipecacuanha preparations were undesirable. In the opinion of Dr. Wild and himself, a solution of emetine in plain spirit, made about the same alcoholic strength as the wine, would be much better to use. In place of Dover's powder he had made for a local physician a solution of hydrochloride of emetine and hydrochloride of morphine in alcohol of the same strength as the powder, which had been used for some years with good results. The strength of the solution used is 1 dr. = 15 grs. of the powder.

The PRESIDENT said the Conference was much indebted to Dr. Paul for his remarks. He then called upon Dr. DOBBIN, who was received with applause, to read the following paper:—

Note on Aromatic Sulphuric Acid.

By LEONARD DOBBIN, PH.D.

Some time ago my attention was arrested by the remark made by Atfield respecting aromatic sulphuric acid (*vide* his "Manual of Chemistry," 17th ed., page 367), that it has been stated that in this preparation the sulphuric acid and the alcohol form some sulphovinic acid, but that he has been unable to detect the latter acid. In view of the tolerably rapid formation of sulphovinic acid by the interaction of sulphuric acid and alcohol when heat is applied to a mixture of these substances in about equal proportions by volume, and also of what we know concerning its gradual formation when the same materials are mixed slowly (so as to avoid any considerable rise of temperature) and the mixture is preserved at ordinary temperatures for a length of time, it appeared almost impossible to doubt that some of this acid must be present in all aromatic sulphuric acid, and that the quantity should be greater in old than in recently prepared samples.

On looking into the literature of the subject, statements were met with which are directly contrary to each other.

Under the heading of Aromatic Sulphuric Acid, Caspari states, in his "Treatise on Pharmacy" (2nd ed., 1902, pages 471-2), that "upon standing, chemical action ensues and a part of the sulphuric acid is gradually converted into ethyl-sulphuric or sulphovinic acid." No authority is quoted.

In the acidimetric test for acid. sulph. aromat. in the U.S. Pharmacopœia, 1890, it is explained that the preliminary boiling of the acid for several minutes with some three times its volume of water is "so as to decompose the ethyl-sulphuric acid."

That ethyl-sulphuric acid is present in aromatic sulphuric acid is definitely stated in Remington's "Practice of Pharmacy" (3rd ed., 1894, page 484); whereas the compilers of the U.S. Dispensatory, of whom Remington is one, in the 18th edition of that work, page 95, quote Atfield's original paper (*P. J.* [2], 10 (1869), page 471), embodying the experiments upon which the statement in his manual is based, in support of the opposite view.

On account of this divergence of statement by pharmaceutical authorities it seemed desirable to re-examine the matter. With this object in view, I tested, in the first instance, a sample of aromatic sulphuric acid only four days old, which was kindly prepared for me for the purpose by Mr. J. Rutherford Hill. (On the mixing of the alcohol and the sulphuric acid, when making this preparation, the temperature rose from 18° to 53° C.) A portion of the sample was first diluted with four times its volume of water, and the resulting liquid was briskly agitated with excess of barium carbonate until the mixture no longer reddened a strip of blue litmus-paper. After standing over-night to settle, the nearly clear liquid was carefully decanted from the sediment of barium sulphate and carbonate and filtered. The filtrate was evaporated to dryness at a temperature which never exceeded 30° C. The residue was treated several times with absolute alcohol in the cold to dissolve any oil of cinnamon or extractive matter derived from the tincture of ginger. The portion of the residue which still remained undissolved was next mixed with water to dissolve any barium sulphovinate present, and the mixture was filtered. A residue which was left on the filter-paper dissolved completely and with effervescence in dilute hydrochloric acid, and consisted of barium carbonate deposited during the evaporation of a solution which had contained barium bicarbonate. The filtered aqueous liquid contained a barium salt in solution, and on evaporation in a confined space over sulphuric acid it yielded four- and six-sided crystalline plates of the kind obtainable from solutions of barium sulphovinate. When these crystals were heated with potassium carbonate and solution of iodine the odour of iodoform was plainly distinguishable, and when their aqueous solution was boiled a white precipitate of barium sulphate was formed.

The total quantity of barium sulphovinate obtained, at the end of the operations described above, from 2 fl. oz. of the aromatic sulphuric acid employed, did not amount to over $\frac{1}{2}$ gr.

After the remainder of the stock of aromatic sulphuric acid had stood for two months, another trial, parallel in every respect with the one just described, was carried out with 2 fl. oz. of it. The final residue of barium sulphovinate was considerably greater in quantity in this experiment than in the preceding one, but still it only amounted to somewhat less than 2 gr.

It was further thought desirable, for the sake of comparison, to experiment with an old sample of aromatic sulphuric acid. Mr. J. Innes Fraser was good enough to furnish me with a sample, the actual age of which was not quite certain, although it was definitely known to be more than a year old. Two fluid ounces of this sample, treated as before described, yielded, relatively speaking, quite a large quantity of barium sulphovinate, the weight of the final residue amounting to 43 gr.

It was not possible, owing to the nature of the operations to be carried out, to make these experiments anything more than rough quantitative approximations, to be used for purposes of comparison. The results obtained are, however, in general accordance with what was anticipated, and they show (1) that aromatic sulphuric acid, when a few days old, does contain some sulphovinic acid, although the quantity is very small, and (2) that the quantity of sulphovinic acid gradually increases when aromatic sulphuric acid is kept for a length of time.

It seems probable that the rate of formation of sulphovinic acid (depending, as we know it does, on the temperature) may be considerably more rapid in aromatic sulphuric acid at summer temperatures than it is in winter.

It is my intention to further examine, periodically, the progress of the formation of sulphovinic acid in aromatic sulphuric acid as the latter grows older.

DISCUSSION.

Mr. J. RUTHERFORD HILL said they were deeply indebted to Dr. Dobbin for his paper. He had never been able to discover any record of experiments on the subject except the negative result of Attfield. The modern formula reduces the amount of sulphovinic acid. The old Edinburgh Pharmacopœia method was to keep the ingredients for forty-eight hours at a warm temperature. One exceedingly valuable

work to the pharmacist—namely, "Pharmacopœia," states that the odour is probably due to sulphovinic acid. The paper confirmed some qualitative experiments made by Mr. Duncan and himself some years ago, in which they obtained barium in solution apparently as sulphovinate.

Mr. EDMUND WHITE, called upon by the President, said he felt that Dr. Dobbin had wasted his time in investigating such a foolish statement as that which was the basis of his paper; because it was evident that if they mixed sulphuric acid and alcohol decomposition was bound to go on.

Dr. DOBBIN was asked to reply, and he said that he would only read a letter which he had received from Dr. Attfield, which was as follows:—

DEAR DR. DOBBIN,—I thank you for letting me see a proof of your note on the question of the presence or absence of sulphovinic acid in the aromatic sulphuric acid now official. Thirty-three years ago, in the article made with the powders of cinnamon-bark and ginger, I found no sulphovinic acid (*P. J.*, 1869, page 471). Seventeen years ago, in the aromatic sulphuric acid made with strong tincture of ginger and spirit of cinnamon, Martindale found some sulphovinic acid "on keeping" (*P. J.*, 1885-6, page 452). Now you show that in the aromatic sulphuric acid made with tincture of ginger, spirit of cinnamon, and the slightly stronger spiritus rectificatus, a very small quantity of sulphovinic acid is found when the article is "a few days old," and the quantity "gradually increases when aromatic sulphuric acid is kept for a length of time." I do not think that the slight variations in the official formulæ of 1867, 1885, and 1893, just alluded to, much affect the question. How an operator practically interprets the word "gradually" when mixing the sulphuric acid with the spiritus rectificatus probably has more to do with the matter. A more important factor, doubtless, will be the temperatures of the four ingredients before admixture; still more important the age of the sample when analysed. I am glad you intend to make further experiments. As to the statement in my "Manual of Chemistry," even your present results will induce me, in the eighteenth edition, to omit the words you have quoted, and to add as follows: "Aromatic sulphuric acid may or may not contain a little sulphovinic acid, dependent on the internal and external temperature during and subsequent to preparation, the age of the sample, &c."

Yours faithfully,

JOHN ATTFIELD.

The next paper taken was the following:—

Chinese Oil of Neroli.

By JOHN C. UMNEY, F.C.S., and C. T. BENNETT.

Two or three years ago a small sample of an oil described as Chinese neroli oil was sent to Messrs. R. Quincey & Son, of London, in order to ascertain whether it would be worth while to distil it for the European markets. The distillers were advised that there was little probability of a market for the oil in London, but suggestions were made as to distillation. Recently a consignment of several pounds of the oil has been received, and a portion of the oil was purchased for examination by the authors. The oil is stated to be derived from *Citrus triptera* (*trifoliata*), a species of *Citrus* which grows luxuriantly in Southern Europe, its fruit, as met with in Italy, resembling the mandarin orange, although not equally edible. In England also the plant will grow out of doors, but does not flower. A peculiarity of this species of *Citrus* is that it possesses a considerable number of spines, and is on that account used to form a defensive hedge.

Information as to the district of cultivation and distillation in China is inexact, but the oil examined came from Foochow, near Canton. The oil is of a yellowish-brown colour, becoming paler on exposure to light, and having a very slight and almost imperceptible blue fluorescence, which is very marked when the oil is largely diluted with alcohol. It has a peculiar sweet odour, recalling a mixture of the oils of neroli, lavender, and tarragon. It had the following physical characters: Sp. gr., 0.850 at 15° C., and optical rotation in a tube of 100 mm., +35°. A preliminary examination of its chemical characters gave the following results:—

Esters as linalyl acetate	...	...	4.79 per cent.
Free alcohols as linalool	...	...	21.41 per cent.
Total alcohols	...	...	25.17 per cent.

This shows that it contains non-saponifiable matter, agreeing with French neroli oil which contains a paraffin hydrocarbon.

Fractionation at ordinary atmospheric pressure gave the following results:—

Below 170° C.	nil
170 to 175°	30 per cent.
175 to 180°	14 per cent.
180 to 185°	21 per cent.
185 to 190°	7 per cent.
Above 190°	28 per cent.

100

present calculated as methyl anthranilate, amounts to less than 4 per cent.

From the above results it would appear that the chief constituents of the oil are limonene, camphene (?), linalool, linalyl acetate (traces), methyl anthranilate, and a paraffin hydrocarbon.

The principal physical and chemical characters of this oil in comparison with oils of neroli and petitgrain are as follows:—

	Neroli			Petitgrain
	Chinese	French (Bigarade)	French (Portugal)	
Sp. gr.	0.860	0.870 to 0.880	0.860	0.885 to 0.900
Optical rotation	+35°	+1° to +5°	About 30°	-2° to +4°
Esters as linalyl acetate	4.79	10 to 20 per cent.	About 6.5 per cent.	50 to 75 per cent.
Free alcohols as linalool	21.41 per cent.	20 to 25 per cent.	—	25 to 35 per cent.
Appearance	Fluorescent	Fluorescent	Not fluorescent	Not fluorescent
Known constituents... ..	Methyl anthranilate	Methyl anthranilate	No methyl anthranilate	No methyl anthranilate
	Linalool	Linalool	Solid hydrocarbon	Linalool
	Linalyl acetate	Linalyl acetate	Linalool	Linalyl acetate
	Limonene	Limonene	Dextro limonene	Limonene
	Camphene (?)		Dextro camphene	

During distillation at ordinary pressure it was evident that considerable decomposition occurred, and in consequence 100 c.c. of the oil was fractionated under a reduced pressure of about 20 mm., three principal fractions being obtained, viz.:—

- No. 1 fraction, boiling 95 to 110° C. (65 per cent.)
 No. 2 fraction, boiling 110 to 125° C. (14.5 per cent.)
 No. 3 fraction, boiling 125 to 150° C. (10.0 per cent.)

Fraction No. 1.—After repeated fractionation this was separated into three portions, as follows:—

- (a) Amounting to 18 per cent. of the original oil, distilling between 93° and 97° C., having a boiling-point at ordinary atmospheric pressure of 165° to 175° C., and an optical rotation (100 mm.) of +30°.
 (b) Amounting to 25 per cent. of the original oil, distilling between 97° and 99° C., with a boiling-point of 170° to 178° C. at atmospheric pressure, and an optical rotation of +39°.
 (c) Amounting to 22 per cent. of the original oil, distilling between 100° and 110° C., having a boiling-point at ordinary atmospheric pressure of 173° to 185° C., and an optical rotation of +53°.

Consideration of these characters indicates that fraction No. 1 consists of a mixture of two terpenes, one of which is certainly limonene, and the other of lower optical rotation and lower boiling-point, not improbably camphene.

Fraction No. 2 was separated under reduced pressure into two principal fractions, viz.:—

- (d) Amounting to 7 per cent., boiling at 110° to 115° C. under reduced pressure, and 175° to 190° C. at ordinary atmospheric pressure.
 (e) Amounting to 7.5 per cent., boiling at 115° to 125° C. under reduced pressure, and 180° to 195° C. at ordinary pressure.

Fraction No. 3 was also separated into two fractions, boiling under normal pressure from 190° to 220° C., practically the whole of which, together with Fractions D and E, consists of linalool.

It seemed likely from the odour of the oil that isoeanethol (estragol, the characteristic odorous constituent of tarragon oil) might be present in the oil, but the authors have not been able to determine this by means of the tests described by A. C. Chapman (*Chem. Ztg.*, xxiv., page 376). During distillation a distinct blue fluorescence was observed in all the fractions, due unquestionably to the presence of the methyl ester of anthranilic acid (the characteristic ester of neroli oil), which, not being easily decomposed, is carried over with the constituents of lower boiling-point. The process for estimating methyl anthranilate recommended by Hesse and Zeitschel (*Berichte*, 1901, page 296) was used for the separation and identification of that substance, but reliable quantitative results could not be obtained owing to the solubility of the anthranilic acid in ether. The percentage, however, is small, since the total quantity of esters

It will be observed that Chinese neroli oil is most closely allied to the so-called Portugal oil distilled from the flowers of sweet orange; the latter, however, contains no methylanthranilate. The authors are of opinion that Chinese neroli oil cannot replace French oil of neroli, or any of the different varieties of oil of petitgrain as imported into England. Nevertheless, the oil has an extremely pleasant and characteristic odour, which certainly could be taken advantage of, both unmixed or blended, for toilet perfumery, or for perfuming soap.

The PRESIDENT remarked on the interesting character of the oil, of which samples were passed round, and intimated that the proceedings after luncheon would begin with Mr. Umney's paper on olive oil.

The meeting adjourned at a few minutes before 1 o'clock, the proceedings so far having been gone through expeditiously. On resuming, at 2.15, the President's promise was kept, and the following was read in abstract by the author:—

Olive Oil: Commercial Varieties and the Pharmacopœial Tests.

By JOHN C. UMNEY, F.C.S., and C. T. BENNETT.

The British Pharmacopœia characters and tests for fixed oils do not compare favourably with the means of identification prescribed therein for other classes of drugs. The characters of and tests for castor oil have already been called in question (see Parry, *C. & D.*, May 23, 1898, page 892; Thursfield, *P. J.*, January 21, 1899, page 73; Lucas, *P. J.*, January 28, 1899, page 93; Umney, *P. J.*, January 6, 1900, page 8), whilst those for linseed oil certainly require some modification (Tichborne, *P. J.*, November 24, 1900, page 573). It is perhaps more difficult to frame characters and tests for olive oil than in these cases, as supplies are drawn from widely different districts, the oils are prepared by somewhat varying methods, and are used in large quantities for lubricating, illuminating, leather-dressing, &c., and in smaller quantities for edible purposes, so that it is natural to expect some wide difference in general character. There are excellent reasons, however, why pharmacists should ascertain whether all the grades of oil that they may handle are pure, and correspond with the requirements of the British Pharmacopœia. The purpose of the work done for this paper was to determine whether the official characters and tests are reliable indications of pure oils. The authors have examined most of the varieties of olive oil as met with in this country, which are principally obtained from Italy, France, Spain, Algeria, and the Ionian Isles.*

The oils chiefly required in pharmacy are described as cream or virgin oil, sublime oil, and fine oil.

* For further information as to the source and production of olive oil in different parts of the world, those interested in the subject would do well to refer to a publication by Mr. F. Boehm.

The first-named is, as a rule, produced from hand-peeled fruit by slight pressure, and sublime oils are, as a rule, prepared by equal pressure from the whole fruits both skinned and pulped. The cheapest oils are prepared by strong pressure from the whole fruits, and the oil subsequently prepared by hot pressure is used for other than pharmaceutical purposes. There can be no question that much of the olive oil that reaches this country does not necessarily come from the district of its production, as statistics clearly show that at any rate into some of the districts of Italy which largely export olive oil to this country, enormous imports of olive oil are made from other districts.

which the authors have found most satisfactory is Renard's, but the authors have not been able to prove conclusively a smaller proportion than 10 per cent. of admixture. The test consists in separating the fatty acids, and precipitating with alcoholic lead acetate; the oleate is dissolved out with ether, and the residual lead stearate (palmitate and arachate) is decomposed by hot dilute hydrochloric acid. The fatty acid cake is dissolved in 5 parts of hot alcohol, and on cooling crystals of arachic acid separate.

The following table gives the physical constituents and behaviour of type oils with the various reagents referred to:—

—	Olive, Virgin	Olive, Sublim.	Olive, Fine	Sesame	Cottouseed
Sp. gr. ...	0.9167	0.9179	0.9164	0.9266	0.9230
Iodine number	81.73	82.15	80.06	100.91	103
Becchi ...	Slightly greenish	Yellowish-green	Brownish-green	Yellow, meniscus golden	Reddish-brown
Halphen ...	Yellow	Yellow	Yellow	Yellowish white	Distinct red tinge with 1 per cent., deep red with 10 per cent.
Elaidin ...	Solid white mass, with green layer	Nearly solid yellowish, no marked green	Nearly solid yellowish	Reddish-brown, semi-solid	Reddish-brown, almost liquid
Tocher ...	Slightly reddish-yellow	Slightly reddish-yellow	Slightly reddish-yellow	Deep violet, distinct violet with 5 per cent.	Reddish-yellow

REVIEW OF RECOGNISED TESTS.

The *Sp. Gr.* given by the British Pharmacopœia, 1898, is from 0.914 to 0.919, but the authors thought these limits might be somewhat narrowed; indeed, the limits of the United States and German Pharmacopœias are from 0.915 to 0.918, and practically include all the olive oils met with in commerce suitable for pharmaceutical purposes.

Solubility.—Practically all the olive oils offered are sparingly soluble in alcohol, but readily soluble in ether, chloroform, and carbon bisulphide; and these tests, as well as reference to odour and taste, might with advantage be included.

Acidity.—It might be desirable to include a test for limit of acidity not exceeding 1 per cent. calculated as oleic acid.

The *Iodine Number* alone serves to practically exclude almost all adulterated oils. It is in the German Pharmacopœia. Experiments show that practically all pure oils of trade have an iodine number varying between 80 and 83, whilst the iodine numbers of sesame oil and cottonseed oil are above 100.

The *Cottonseed-oil* test of the British Pharmacopœia, known as Becchi's, is liable to lead to erroneous conclusions. It is decisive enough if there is 10 per cent. of cottonseed oil in the olive oil to be tested, but not with less. Low-grade olive oils from Spain, Algeria, and Mogador show a tendency to darkening with the test in question, although by other tests they are free from cottonseed and other adulterants. The reaction produced even with 10 per cent. of cottonseed oil is not a decided blackening; frequently it is a reddish-brown. Halphen's test is much more delicate, and detects 1 per cent. of cottonseed oil in lard, olive oil, and very many vegetable oils and fats.

Sesame Oil.—The British Pharmacopœia includes no test for the absence of sesame oil. The authors have found Tocher's test reliable, as it detects 5 per cent. and even less. The reagent is a solution of pyrogallol 2 grams in hydrochloric acid 30 grams, equal volumes of this and the oil being shaken together in a separator, the aqueous layer drawn off into a test-tube and heated for ten minutes in a water-bath. The development of a distinct violet colouration indicates the presence of the sesame oil. It should be noted that after standing for some time a reddish-violet colour develops even with a pure olive oil, but it cannot be mistaken for the decided violet colouration quickly produced by sesame oil.

Arachis Oil.—Although at the present time the difference in price of this oil and olive oil is not sufficiently great to leave any margin for profitable adulteration, it may be worth while to refer to useful tests for its admixture. The test

The results of examinations of a hundred or more samples of olive oils drawn from different districts show that failure to comply with the present pharmacopœial test does not of necessity imply that the oil is adulterated, whilst certain oils unquestionably adulterated with cottonseed oil have failed to produce the indications which would suggest impurity when judged by the British Pharmacopœia test.

The authors suggested the following monograph for a future Pharmacopœia:—

Oleum Olivæ (Olive Oil).—The oil expressed from the ripe fruit of *Olea europæa*, pale yellow or greenish-yellow, having a faint odour and bland nutty taste; sp. gr., 0.915 to 0.918 at 60° F. (15° C.). It becomes pasty in consistence at 32° F. (0° C.), and forms a nearly solid granular mass. Very sparingly soluble in alcohol, readily soluble in ether, chloroform, and carbon bisulphide. Iodine number, 80 to 84.

Five c.c. of the oil placed in a stoppered bottle with 5 c.c. amyl alcohol and 5 c.c. of a 1-per-cent. solution of sulphur in carbon disulphide, and heated for an hour in a boiling saturated solution of sodium chloride, should develop no reddish tinge (absence of cottonseed oil).

Ten c.c. of the oil shaken with 10 c.c. of a freshly prepared solution of pyrogallol (2 grams) in hydrochloric acid (30 grams), and the separated acid liquid heated in a water-bath for ten minutes, no distinct violet colouration should be produced (absence of sesame oil).

DISCUSSION.

Mr. NAYLOR said the subject was one of great importance. It had been his misfortune to condemn oil, not because he believed it was not genuine, but because it would not pass the test of the British Pharmacopœia. He dared say Mr. Umney had taken special precautions to satisfy himself that the oils he had examined and upon which his tests were founded were really genuine oils. He thought this was essential. With reference to the Mogador oil there did not appear to be the slightest temptation—not even on account of the ignorance of those who had to do with the seeds—to adulterate it, and he had come to the conclusion that the tests of the Pharmacopœia very seriously needed amendment. He would like to ask if Mr. Umney had tried what was known as the gold test (chloroform and auric chloride), and whether he had found that that would exclude a large number of oils which were generally used to adulterate olive oil. (Applause.)

Mr. BIRD expressed his satisfaction with the paper. He had had Mr. Naylor's misfortune on many occasions in having to condemn oils which failed to respond to the Becchi tests, and he had always guarded himself by saying, not that they were not genuine, but that they failed to pass the tests of the Pharmacopœia.

Dr. PAUL said repeatedly he had samples of olive oil

passed through his hands which he had reason to believe were perfectly genuine, but which would not stand the Becchi test.

Mr. THOMAS TYRER referred to the relation of the public analyst to traders generally. Again they had the important question raised as to the Pharmacopœia as a standard. That was the reason why he felt impelled to make a remark at that point, to protest against regarding the Pharmacopœia in its present condition as in any sense an infallible standard. It was monstrous that gentlemen of the standing of Mr. Bird, Dr. Paul, and Mr. Umney should have to say that they were convinced that the thing was genuine, and yet have to condemn it. The whole thing seemed contradictory, and all should contribute to a definite, clear, and precise standard, which, through the instrumentality of the Conference, would do inestimable good. (Applause.)

Mr. TOCHER said he was very gratified to learn that Mr. Umney recommended the test for sesame oil which went under his (Mr. Tocher's) name. The German Pharmacopœia contained a test for that adulterant which, he thought, was quite unreliable.

The PRESIDENT said that olive oil had been a Golconda to the American manufacturer who had a product to get rid of and who would try everything that would defeat the tests. They would like very much to have a genuine oil. Though cotton-seed oil was nice and bland, it was not just the kind of oil they would like to have for salad-dressing. They should take care to have genuine articles, and the character of the test Mr. Umney had suggested would fairly cover any likely contamination.

The next paper read was

Note on Cannabis Indica.

By THOMAS MABEN, F.C.S.

This was a supplement to the discussion raised some few months ago by Mr. Merson's paper. Mr. Maben has recently discussed the subject with an expert in the United States, Mr. H. C. Hamilton, who assays the value of cannabis by the physiological test, and some thousands of pounds of the drug and its preparations pass through his hands in the course of a year. The method of testing consists in giving the extract to dogs by the stomach, the quantity administered being from 1 to 1.5 milligram per kilo. weight of dog—say, $\frac{2}{3}$ to 1 gr. per 100 lbs. weight. The result is that after an average dose of active extract the animal in a short time shows signs of excitement and an inco-ordination of its movements, the muscles controlling the legs being particularly affected. This condition becomes more intense from the effect of larger doses, and in some dogs until the animal is scarcely able to keep on its legs or to hold up its head. Insensibility rarely occurs except from immense doses, and Mr. Hamilton has never known death to ensue, the dogs recovering perfectly in every instance, even after a dose of 15 milligrams per kilo. weight (about 1 gr. to 10 lbs.). He is therefore inclined to believe that cannabis is not a poison in the sense that an overdose would be the direct cause of death.

It has been frequently noted that an extract of cannabis is active with one patient and apparently inactive when given to another. With reference to this, Mr. Hamilton has never found an extract that was active on one dog to be absolutely inactive on another dog, or on the same dog at another time. But different dogs vary greatly in their susceptibility to the drug, and in the manner in which they are affected, so that it is necessary to be acquainted with the dog, or to use several dogs, in order to be quite certain how the sample compares with the standard. It is therefore possible that the remarkable idiosyncrasy in the human subject in relation to the drug may, to some extent, account for the belief that some extracts are very active and others quite inert.

Mr. Hamilton states that there is not, in the different samples of drug examined by him, that great variation in activity which is well known to be characteristic of commercial cannabis. It should, however, be explained that only the picked drug is submitted to him, everything in the least degree doubtful as to age or physical appearance having already been rejected; and it is therefore quite certain that his experience does not cover the entire range of the Indian hemp of commerce. While he finds that there

is undoubtedly variation in the quality of the drug, he has never found a sample that was completely inert.

Subsequently to the publication of Dr. Marshall's original paper, Mr. Hamilton extracted from the crude drug an oil which corresponded in almost every respect with that described in that paper, except that it was physiologically inactive. When Mr. Hamilton adopted the method followed by Wood, Spivey, and Easterfield, in preparing the cannabinal which they sent to Dr. Marshall to test—i.e., from the alcoholic extract—he had these results. The oil was very difficult to separate, but he succeeded in obtaining about 1 oz. More could have been obtained under proper conditions, and he is sure that he did not separate all that might have come over. But the fraction that did distil at the temperature and pressure found most favourable by Wood, Spivey, and Easterfield was less active, physiologically, than the original solid extract. It was only slightly active, while the residue was quite active. With reference to the nitro-derivative obtained by Wood, Spivey, and Easterfield, Mr. Hamilton obtained this substance both from the distillate and from the residue. They were similar in appearance and apparently identical with that obtained by these other workers, and both were physiologically inactive. As the result of his experiments Mr. Hamilton believes that the cannabinal prepared according to Wood, Spivey, and Easterfield's process is not the active principle of cannabis; and, further, that so far as our present information extends the active principle has not yet been isolated.

Professor C. R. MARSHALL followed with his note on the same subject. Speaking extemporaneously, he said when he was asked if he could give anything new in regard to cannabis indica he had to confess that he could not, but he thought there was sufficient in the recorded work to bring under the notice of a meeting of pharmacists, as much of it, being pharmacological, was apt to be overlooked. He reminded the meeting that there were three well-known products from the plant—charas, ganja, and bhang. He described the collection of charas, which is done by men clothed in leather, or naked, running through the fields of hemp, whereby the resinous secretion adheres to them, and is afterwards removed. This was an exceedingly valuable as well as potent drug, and one could not buy more than 5 tolas of it at a time; that was about 2 oz. Bhang consisted of the stalks and leaves in the form which he showed to the meeting, and which was used largely for making confections which were of an intoxicating kind. Ganja they were familiar with as the product used in medicine, and recognised by the British Pharmacopœia. His friends, Messrs. Wood, Spivey, and Easterfield, had examined charas, treating it with organic solvents such as ether, and had isolated from it certain definite constituents, including terpene, of the formula $C_{15}H_{24}$, sesquiterpene about 2 per cent., and a small quantity, not more than 0.5 per cent., of paraffin, a toxicified oil boiling at 265°C . at a pressure of 20 mm., which was equal to about 400°C . at ordinary atmospheric pressure, and a resin. They had sent these products to him for pharmacological examination, and it was unnecessary to detail the results of the whole, as the red oil was found to be an active principle. He had taken $1\frac{1}{2}$ gr. of it, and it produced on him such marked intoxication that doctors had to be sent for to get him out of that condition. The third of a grain of this oil was a sufficient dose, and he considered that it contained the active principle of the drug, as it was the only substance of definite composition, the body obtained by slight purification, having the formula $C_{15}H_{24}O_2$. He had isolated 80 per cent. of this body from Smith's cannabinal and also from Merck's cannabinal. He thus assured himself that he was dealing with a pure substance, especially as he obtained from it an acetyl derivative, thus showing that it contained an alcohol. The crystalline acetyl derivative obtained was found to be almost inactive. So far the matter was in abeyance for five or six years, as he desired to keep as a specimen the red oil (which was a very valuable substance) for that period in order to try its effects again, but he might say that much other chemical work had been done, and the action of fuming nitric acid upon it had resulted in the formation of a trinitro cannabinal, and he had also obtained an oxy-cannabene. Thus they were getting to a pure product, and it was while these investigations were proceeding that Mr. Spivey had lost his life, for it was while shaking a solution of the

substance in carbon bisulphide that the flask exploded, the liquid going on fire and severely burning him, and a fortnight later he died from pneumonia which supervened. He (Professor Marshall) had observed that cannabinal, though perfectly stable and remaining a clear, red, thick liquid, in a sealed tube darkened the upper layer and became opaque. That suggested oxidation, and on passing air through it for twenty-four hours it became a thick pitch, with which most of them were familiar as being formed in cannabis-indica preparations. He found that this pitch had no physiological activity, and believed, however, that the loss of activity in preparations of this medicine was largely due to oxidation. All this was said six years ago, and had been corroborated by others, but he found that in discussions on cannabis indica the facts appeared not to be known to pharmacists. Terpenes were, no doubt, an important part of the activity, but especially cannabinal; and referring to the latter he said that manufacturers did not appear to be able to produce cannabinal of more than a quarter the activity of the laboratory samples produced by Wood, Spivey, and Easterfield. Perhaps this was explained by oxidation, or maybe by isomerism, in which connection he recalled the results of physiological experiments he had made for Dr. Jowett on pilocarpine and iso-pilocarpine, which were exactly of the same chemical constitution; but iso-pilocarpine he found to be active. While believing, however, that cannabinal was the active matter of cannabis indica, it might be that an isomeric form of it existed. He said that the purity of preparations depended also on the age of the resin. He believed that much worthless stuff was shipped, but there was very little of the drug used in medicine, and he regarded his investigations as being chiefly of scientific interest, and went on to speak of the work done by various authors. In one paper which had been published it was stated that the active principle was an essential oil, and Dr. Prain's experiments on that matter had been explained by two Italians, who showed that his oil is an impure sesquiterpene. He would not venture on that occasion to criticise Mr. Maben's paper, although much might be said about it, and when he wrote his own paper it would be seen that all points were attended to.

The PRESIDENT thanked Professor Marshall for his interesting statement, and

Mr. J. C. UMNEY explained some experiments he had made with the view of getting over the objection to extract of cannabis indica forming two layers. He had used acetone to extract the drug, and thus was enabled to evaporate at a lower temperature. The extract so obtained was compared with the ordinary alcoholic extract by Dr. Dickson, of Cambridge, and it was found that the alcoholic product was much more active.

There was no discussion on these communications, and they were followed by one on

Oxidation and Determination of Uric Acid and Urates.

By J. F. TOCHER, F.I.C., F.C.S.

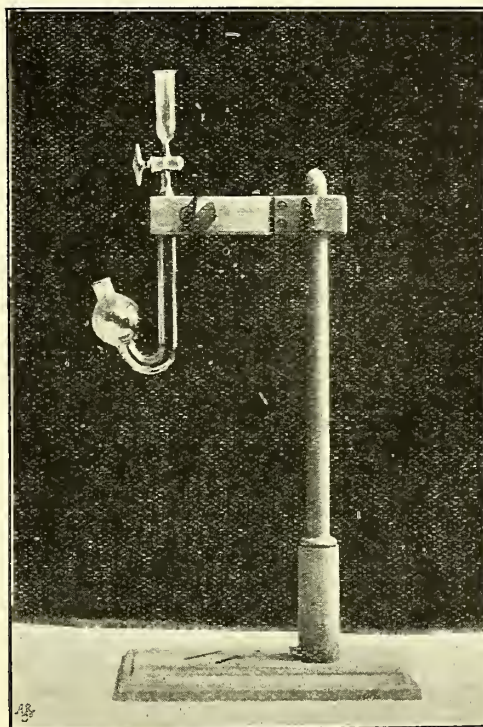
A simple and rapid method for the determination of urates would be much valued by medical practitioners, pharmacists, and others who are regularly called upon to examine urine and to perform urine-analysis. Such a method exists for determining the chief nitrogenous constituent—urea. No method, however, exists for determining uric acid, and the process here described is intended to supply to some extent the generally expressed want. It depends upon the fact that uric acid has been found to be quantitatively converted into urea by chromic anhydride, the urea formed being determined in the ordinary way by hypobromite. The first experiments were conducted on pure uric acid, using permanganate as the oxidising-agent, and these experiments throw some light on the nature of the reaction which takes place during the titration of uric acid by Hopkins's method, which is based on the insolubility of acid ammonium urate (*Fukker, J. C. S.*, xxviii., 1,293) and the subsequent titration of the separated urate in acid solution at 60° by $\frac{N}{20}$ permanganate. The author described experiments showing that alloxan is formed when uric acid is treated with acid permanganate in the cold. As alloxan is also found to be acted

upon by permanganate, the inconstant figures obtained by Hopkins's method are easily explained.

On using chromic anhydride instead of permanganate as an oxidising-agent, it was found that uric acid was readily and wholly converted into urea and carbonic acid. A measured quantity of the urate solution (containing 0.084 gram uric acid was treated with about 2 grams chromic anhydride and a little water added. The mixture was boiled for two minutes, cooled, alkalised, and the urea determined by Allen's modified hypobromite process, using potassium cyanate. The following results were obtained:—

Amount Taken	Oxidising Agent	C.c. of N Required by Theory	Nitrogen Evolved	
			Uncorr.	Corr.
25 c.c. solution (= 0.034 gram)	CrO ₃	22.33	24.3	22.1
25 c.c. solution (= 0.034 gram)	CrO ₃	22.33	24.5	22.41
25 c.c. solution (= 0.034 gram)	CrO ₃	22.33	24.1	22.05

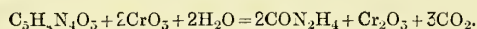
When the hot oxidised uric mixture was treated with alkali prior to being placed in the ureometer, a very faint odour of ammonia was noted in some of the experiments. In order to ascertain whether ammonia was formed to any great extent, the alkaline urea solution from 0.168 gram uric acid was placed in a Kjeldahl flask and distilled into 20 c.c. normal acid, and the acid titrated, when 19.6 c.c. soda was used, representing 0.0068 ammonia in 0.168 gram uric acid, or about 4 per cent. The alkaline residue was evaporated to about 30 c.c. and placed in the ureometer-flask. On treating with hypobromite 1.8 c.c. N was evolved. During the evaporation of the alkaline residue the vapour given off



HYPOBROMITE-TUBE No. 1.
For Decomposition of the Chronic Ureal Fluid.

slowly turned red litmus blue, indicating that the evolution of ammonia was slow. These experiments tend to show that uric acid is converted into urea by chromic anhydride, and that a small portion of the urea may, in a concentrated solution of the oxidising-mixture, be converted into

ammonia. The following equation represents the reaction:—



A modification of the Doremus tube serves to carry out the reaction. From the figure on p. 297 it will be seen that the modified apparatus has a cup and stopcock attached to the upper part of the longer limb of the hypobromite-tube. To determine the uric acid by this tube it is necessary simply to fill the tube with strong hypobromite, and place the oxidised alkalinised uric solution in the cup. On opening the stopcock the solution flows into the hypobromite, and is immediately decomposed. The stopcock is closed when the cup is almost empty, a little water is added, the stopcock again opened, and the water allowed to pass into the hypobromite. The stopcock is again closed, and on gently rotating the tube the reaction is accelerated. After ten minutes the volume is read off. With a solution containing 0.01 gram uric acid 2.8 c.c. N was obtained: theory required 2.6 c.c. (corrected). Constant results were obtained on conducting similar experiments.

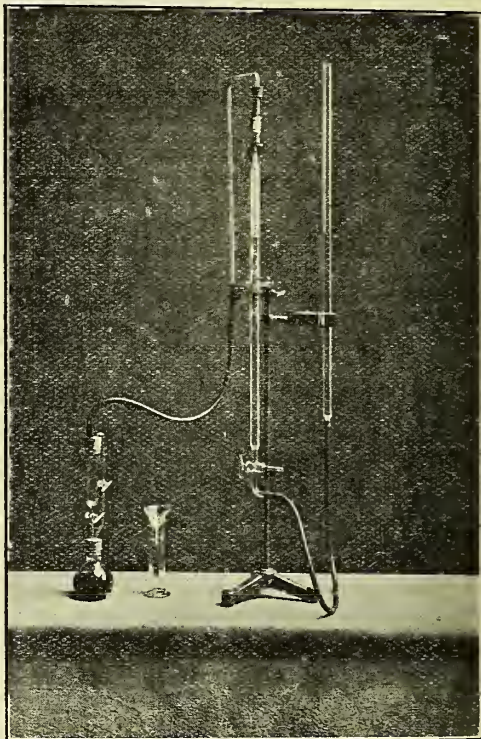
APPLICABILITY OF THE CHROMIC METHOD TO URINE ANALYSIS.

There are several methods of treating urine in order to separate urates. The method adopted here is to precipitate as acid ammonium urate by adding solid ammonium chloride to 50 c.c. urine until the fluid is saturated. Set aside for an hour. Collect the precipitate on a filter, and wash with ammonium-chloride solution. Dissolve in a little weak soda solution, and boil to expel ammonia. The solution is now treated with a little sulphuric acid and about 2 grams chromic anhydride, and boiled for two minutes. After cooling, the fluid is alkalinised to make up to 50 c.c. For the purpose of determining the nitrogen 25 c.c. (= 25 c.c. urine) is placed in the cup of the hypobromite-tube. The amounts of nitrogen evolved in several experiments were 2.9, 2.8, 2.9, 2.8, 2.8 (uncorrected), using hypobromite alone [2.8 c.c. N (uncorrected) in 25 c.c. represents 0.42 per cent. uric acid]. Twenty-five cubic centimetres of the same sample treated with solid ammonium chloride, and the precipitate dissolved in dilute acid required by Hopkins's method 13.6 c.c., and $13.6 \times 0.0075 \times 4 = 0.408$ per cent. uric acid. Where extreme accuracy is desired, and when the proportion of uric acid in urine is small, the whole ammonium-urate precipitate from 50 c.c. urine may be taken, treated with soda and then with $\text{H}_2\text{SO}_4 + \text{CrO}_3$, and determined as N in the gas-burette, using the special arrangement described in this paper. A sample, low in urates, was treated in this way, 50 c.c. being used; 29.5 c.c. N (corrected) was evolved. Fifty cubic centimetres of the same sample, determined by Hopkins's method, required 14.0 c.c. $\frac{N}{10}$ permanganate. The uric acid as shown by the Hopkins and chromic methods amounted therefore to 0.218 and 0.21 per cent. respectively. A further portion of the same sample was reserved for treatment with chromic anhydride direct, as described in the following experiments, which were carried out with a view to simplify the chromic process for clinical use.

TOTAL NITROGEN MEASURED IN HYPOBROMITE-TUBE.

Urea when treated with dilute sulphuric acid and chromic acid undergoes scarcely any change, even if boiled for a minute or two. The ammonia formed is very small in amount. As urates are quantitatively converted into urea by boiling with sulphuric acid and chromic acid, the uric and urea nitrogen can quite approximately be determined in the hypobromite-tube, the nitrogen as urea deducted from the total nitrogen, giving the uric-acid nitrogen. Experiments with prepared solutions of urea and uric acid were first carried out. Solutions of (1) urea (2 per cent.), (2) uric acid (0.75 per cent.), and (3) urea (2 per cent.) + uric acid (0.75 per cent.) were prepared, and the nitrogen in each determined in the hypobromite-tube, which was graduated to show 0.001 gram urea (= 0.0014 uric acid). One cubic centimetre urea solution gave 0.02 gram urea; 1 c.c. uric solution gave an equivalent of 0.002 gram uric acid, so that about 26 per cent. of the uric acid was decomposed without the addition of chromic acid. It is well known that uric acid yields with hypobromite varying amounts of nitrogen (20-70 per cent.), according to the degree of concentration, &c. Ten cubic centimetres of

uric solution boiled with chromic and sulphuric acids, made up to the original bulk, and 1 c.c. taken, gave 0.006 gram urea, or an equivalent of 0.008 gram uric acid (theory 0.0075 gram); while 1 c.c. of the mixed uric and urea solution treated in a similar manner gave 0.0255 gram urea, 0.02 gram being due to urea and 0.0055 gram (= 0.0077 gram uric acid) to the uric acid present. An experiment with the sample of urine giving 0.21 per cent. uric acid by the chromic and Hopkins methods was conducted in the hypobromite-tube.



NITROMETER, WITH FLASK AND FITTINGS,
Showing Arrangement for Decomposing the Ureal Fluid.

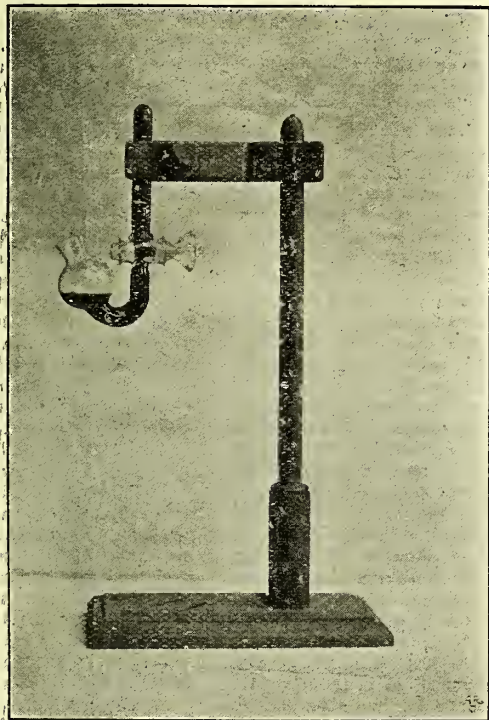
Ten cubic centimetres of the sample was boiled with a little $\text{H}_2\text{SO}_4 + \text{CrO}_3$, cooled, and made up to the original bulk; 1 c.c. gave 0.0225 gram urea, 1 c.c. of the untouched sample gave 0.021 gram urea. Then $0.0225 - 0.021 = 0.0015$ gram due to uric acid. This is equal to 0.002 gram uric acid in 1 c.c., or 0.2 per cent. Experiments with other samples gave concordant results. This process is a simple technical one, and can be carried out in a few minutes. It should be very useful to those engaged in the daily examination of urine. The tests should be carried out as follows:—

(1) With nitrometer (for urine low in urates).—Saturate a measured quantity of urine with solid ammonium chloride (as in the Hopkins and other methods) and collect the ammonium urate. After washing with NH_4Cl solution, dissolve in weak soda solution, and boil off the ammonia. Acidify the fluid with a dilute sulphuric acid, and add 2-3 grams chromic anhydride, and boil. Cool, and transfer to the separating-funnel of the gas-measuring apparatus. Place the hypobromite solution in the flask, and connect the whole apparatus, taking care to equalise the measuring-tube. Open the funnel stopcock, and permit the chromic mixture to flow into the hypobromite. Nitrogen is immediately evolved, and is read off after ten minutes' standing: 1 c.c. N = 0.00375 uric acid.

The construction of the reaction-flask requires to be explained. It is similar to that described by Allen. A small flask is fitted with an indiarubber cork with two apertures. The limb of the funnel-tube is passed into one, and a stopcock-tube into the other. The funnel-tube is also fitted with a cork with two apertures. The other end of the stopcock-tube is bent round and passed through one aperture, while the other aperture is fitted with a small glass tube, to which, when necessary, the rubber tube of the nitrometer is attached. The chromic mixture is run into the funnel-tube through the

small tube, which for this purpose is temporarily connected with a small funnel by means of a small indiarubber tube. The arrangement here described prevents the displaced air from the flask reaching the measuring tube of the nitrometer.

(2) With hypobromite-tube (for clinical work).—Measure 10 c.c. of the sample, and place in a small beaker with about 2 c.c. dilute sulphuric acid and 2 grams chromic anhydride. Boil for two minutes, placing in the fluid a small glass rod to prevent bumping. Allow the fluid to cool, and make up the volume to 10 c.c. Prepare some strong hypobromite solution by adding 2.5 c.c. bromine to



HYPOBROMITE-TUBE No. 2.

For Determination of Urea in 1 c.c. Sample.

30 c.c. strong caustic-soda solution. Fill the tube, and measure 1 c.c. into the cup (of the modified hypobromite tube; if the ordinary tube is used, take the 1 c.c. pipette), and gradually pass the urinary fluid into the hypobromite solution. Rotate the tube gently to promote the reaction, and then read off. The tube is graduated to show milligrams in 1 c.c., and 0.001 gram urea = 0.0014 gram uric acid, so that each division is equal to 1 milligram of urea and 1.4 milligram of uric acid. Determine the urea present, using 1 c.c. of the sample from which the urates have been precipitated as barium urate, a little powdered barium chloride and a drop of two or baryta water are added, and the whole stirred. After the precipitate has subsided, 1 c.c. is withdrawn for determination of urea. Deduct the amount from the uric-acid urea as found by the chromic method, and multiply by 1.4. This gives the uric acid in milligrams in 1 c.c. of urine; multiplying, instead, by 140 gives, of course, the percentage. The nitrogen of the oxaluric bases may be included, but the amount is so small that in this process the result is not materially affected.

The determination of uric acid and of the oxaluric bases by titration with bichromate and iron will be given in a future paper.

Mr. TOCHER added an appendix to his paper, which consisted simply of descriptions of the following methods: Allen's alkalimetric ("Com. Org. Anal.," vol. iii., part iii., 364), Bartlett's, Bayrac's, Bellocq's, Boulet's (*Bul. Soc. Chem.*, 25, 251), Camerer's, Haycroft's, Gautrelet's, Gigle's, Hopkin's, Jolles's (*Zeit. Phys. Chem.*, 1900, 29, 222-243), Mollet's (*Zeit. Anal. Chem.*, 1899, 33, 396, 397), Pavy's piperidine (Tunnicliffe and Rosenheim's, *Cent. Physiol.*, 1897, xi., 434), Rugler's (*Zeit. Anal. Chem.*, 1893, xxxv., 31), Salkowski's (Watts's "Dic. Chem.," iv., 834), Salkowski and Ludwig's (*Chem. Centraltbl.*, page 523), Werner's (*P.J.*, 1900, x., 632).

The PRESIDENT, in thanking Mr. Tocher for his paper, said it was of such a painstaking character that it would prove a valuable addition to the chemistry of the subject. (Applause.)

The PRESIDENT said he would rely now upon Mr. Edmund White to fill up the afternoon.

First was read—

Aseptic Surgical Shaving-paste.

By EDMUND WHITE, B.Sc., F.I.C.

Following up the provisional formula which he published a few months ago (see *C. & D.*, lx., page 342), the author has prepared the following improved formula:—

Hard paraffin (m.-p. 55° C.)	...	...	22 parts by weight
Prepared suet	...	...	3 parts by weight
Soft soap	...	...	2 parts by weight
Boiling water	...	...	63 parts by weight

Place these materials in a vessel surrounded by boiling water, and when the fats are melted beat them together until a smooth, white emulsion is obtained. Continue the beating, maintaining the temperature above 70° C., and shake in gradually—

Tragacanth in powder	2 parts
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When the mixture is homogeneous, allow it to cool by removing the boiling water, and when nearly cold add—

Glycerin	...	...	2 parts
Oil of lavender	...	...	1 part

The author employs the ordinary beater mixing-machine for mixing, but small quantities may be made equally well by means of an egg-whisk in a stone jar standing in a saucepan of boiling water. A small quantity of the paste is rubbed over the area to be shaved, and the razor immediately applied. The amount required varies somewhat with the texture of the skin and hair, but a little practice gives the necessary indication. The material has been in use in St. Thomas's Hospital for about twelve months, and gives satisfactory results. For shaving in the hospital, apart from surgical preparations, its use is compulsory unless the patient provides his own brush and soap, so that the transference of skin disorders, apart from general septic contamination, is reduced to a minimum.

Samples of the paste in collapsible tubes were examined by the PRESIDENT, who said that, although it hardly came within the purview of ordinary pharmacy, the preparation would prove extremely useful in surgery.

Mr. E. S. PECK paid tribute to the excellence of Mr. White's paste as a result of personal experience, and Mr. White was thanked.

Compressed Tablets.

A General Method for Dispensing.

By EDMUND WHITE, B.Sc., F.I.C., and R. A. ROBINSON, JUN.

The use of compressed tablets in medicine has been limited almost entirely to stock formulæ owing to the difficulty of dealing with materials for compression in some general way, comparable to the use of simple excipients in pill-making. The object of this note was to communicate a method which yields satisfactory results with materials of all varieties. It is as follows:—

Melt 1 part of oil of theobroma, and add 3 parts of starch in powder. Stir thoroughly while continuing the application of heat, and when uniformly mixed allow to cool. This mixture constitutes the general excipient. For the production of tablets add this excipient to the material to be compressed so that the mixture contains from 5 to 10 per cent. of oil of theobroma.

The oil imparts a somewhat granular character to the mixture, sufficient to enable it to flow easily and uniformly into the mould, and comparatively light pressure produces a tablet which may be dropped without fracture, and at the same time may be crushed to powder between the fingers or disintegrated rapidly in water at body-temperature. The authors were not prepared to state that this method is as good as granulation for the manufacturer, but it enables one to dispense tablets from a prescription with the ease and simplicity of dispensing pills. The time and trouble involved in damping, sifting, and drying, incidental to the method of granulation, are entirely avoided, and lubrication of the

moulds and dies during compression is unnecessary. Similar results may be obtained by using paraffin-wax in place of oil of theobroma, but the latter appears to be more satisfactory, probably owing to its lower melting-point. The mixture of medicament with the starch-theobroma excipient should be quite cold before beginning the compression, otherwise it has a tendency to adhere to the parts of the machine. As a general rule 4 gr. of material requires 1 gr. of the excipient, but if much sugar be present rather more must be added.

DISCUSSION.

Mr. J. C. UMNEY thought the method would not answer in making tablets of granulated citrate of lithia and such preparations. A turbid, oily mixture would, he thought, be produced.

Mr. N. H. MARTIN wanted to know whether the substances used would have to be in fine powder.

Mr. G. F. MERSON inquired whether each quantity was weighed, and whether automatic feeding were possible in all cases with the universal excipient recommended by Mr. White.

Mr. PETER MACEWAN said the point of the paper lay in the fact that it corroborated the suggestion of Mr. Stewart Hardwick at the Liverpool Conference, to use a mixture of cocoa-powder in dispensing tablets. Mr. White's formula appeared to have the same advantages, and it possessed the further inestimable advantage of being colourless. He considered that Mr. White had done good service to dispensing pharmacists in the evolution of this formula. Perhaps it would not be suitable for manufacturers in all cases, but the wholesalers were quite capable of looking after themselves. (Laughter and "Hear, hear.")

The PRESIDENT, who exhibited samples of phenacetin tablets made by Mr. White, pointed out that they were excellently made, and quite colourless. The latter was the great desideratum. With regard to substances like citrate of lithia, he could quite understand that there would be difficulties, but that made no difference, as the formula would be perfectly applicable to nine-tenths of the substances to be compressed, and it appeared to afford a desirable and easy way of making tablets for the retail pharmacist.

Mr. WHITE, replying, said the machine he used was an automatic feeder, with which he could make about ten tablets in a minute. The powder was simply mixed in a mortar and fed into the machine, and by his method he could make 2 lbs. of mercury with chalk without trouble, and they might make 30 lbs. Some machines would probably not produce so satisfactory results with his formula, but in that case he thought a machine should be obtained to suit the powder, and there were many with which it answered perfectly well.

Liquor Thyroidei.

By EDMUND WHITE, B.Sc., F.I.C.

Several observers have drawn attention to the unsatisfactory keeping properties of this preparation, and in this note it was pointed out that the preservative action of glycerin in it is almost *nil* with materials so liable to putrefaction. With the following modification one may obtain a preparation which keeps perfectly well, and is quite free from objectionable odour:—

Trim the glands and weigh them, slice and bruise them, and for every 20 grams of tissue add 15 c.c. of glycerin. Macerate for twenty-four hours strongly, express, and make up the expressed product to the required volume [see B.P.] by the addition of a mixture of equal parts of glycerin and water.

This procedure is based upon the assumption that the fresh tissue contains 75 per cent. of water, an assumption justified by experimentally drying a large number of samples in the water-oven at 100° C. The fluid present in the finished preparation is then composed approximately of equal parts of glycerin and water by volume, and with this proportion the addition of phenol, chloroform, or other antiseptic is quite unnecessary.

DISCUSSION.

Mr. BIRD commended Mr. White's paper as most practical and useful. As he knew from personal experience, it was so easy a matter to overlook the water in the glands, and it

was just one of those things that might be overlooked for a long time, with disastrous results.

The PRESIDENT characterised the paper as one of those practical efforts which show the wisdom of the Conference meetings, and the advantage of having contributions from thoroughly practical men.

Tasteless Cascara Sagrada Preparations.

By EDMUND WHITE, B.Sc., and R. A. ROBINSON, jun.

After experimenting with numerous published formulæ for disguising the bitter taste of liquid extract of cascara sagrada, the authors concluded that none of the products was very satisfactory. They found that the bitterness had almost or entirely disappeared in certain samples after standing several weeks, especially in those which contained aromatic spirit of ammonia. The non-bitter mixtures were tested clinically, and found to be active as purgatives. The experiments were repeated with other samples of extract with similar results. The authors then exhausted some cascara sagrada bark by percolation with water, and divided the percolate into three parts. The percolate was strongly acid to test-paper; one part was rendered strongly alkaline with potassium hydroxide, another with strong solution of ammonia, and the third with sodium bicarbonate, using the alkalies in equivalent proportions. The three products were evaporated, and after about three hours were rendered tasteless, the evaporated products being dark and clear, and miscible with water without precipitation. The products were all active, although from the inherent difficulties of such observations it could not be definitely stated that their activity was equal to that of the original bitter extract. On looking up the literature of the subject, the authors found that they had been anticipated to some extent by E. Aweng (*Oesterr. Zeits. für Pharm.*, 55), who recommended the evaporation of the percolate after addition of ammonia, precipitation of the bitter substance with lime, and subsequent removal of the excess of lime by means of tartaric acid. In the authors' experience this treatment may be simplified by adding for each 100 c.c. of finished extract 5 grams of potassium hydroxide or 7 c.c. of strong solution of ammonia, heating on a water-bath for three hours or until the bitterness has disappeared, and finishing off the product in the usual way. Sodium bicarbonate was found to be less effectual than potassium or ammonium hydroxide. In the present state of our knowledge concerning the active principles of cascara sagrada, it is difficult to give an explanation of this behaviour of the extract towards alkalies, but the results would appear to indicate that the bitter substance may possibly be an anhydride or lactone, which, in the presence of an alkali, is converted into an alkaline salt, devoid of bitterness, while still retaining its purgative properties. If the percolate be exactly neutralised by alkali, and a slight excess of alkali added, the acid reaction returns slowly on standing, and more quickly when warmed. The addition of a small quantity of alkali may be repeated with a like result several times, but if the percolate be rendered strongly alkaline at once the bitterness disappears more rapidly. This shows that the conversion of the bitter substance depends upon the degree of alkalinity, and is suggestive of the view propounded. The addition of lime or magnesia to the powdered bark before percolation was formerly recommended for the production of tasteless extracts, but such products appear to be weaker than the official bitter extracts. If experience shows that the product obtained by treating the bitter extract with potash or ammonia retains its activity unimpaired, it indicates that the calcium or magnesium salt of the purgative principle, being insoluble in water, is retained in the marc while the potassium or ammonium compound is soluble and still active.

The authors found that 100 c.c. of a sample of the official extract taken from stock required 0.72 gram of potassium hydroxide for neutralisation. If one-tenth of this quantity of alkali was added to the neutralised fluid and the product warmed, the acid reaction returned, and this addition of alkali and warming were repeated twenty times, involving the addition of a total quantity of alkali of 2.16 grams, and heating for over thirty hours, without a permanent alkaline reaction being obtained or entire loss of bitterness. If, however, 5 grams of potassium hydroxide was added all at

once, the bitterness rapidly disappeared on warming and the product was left slightly alkaline. The time required for removing the bitterness thus appears to vary inversely with the proportion of free alkali present—a result most easily explained by the assumption that the bitter substance is an anhydride or lactone.

DISCUSSION.

Mr. NAYLOR said he had used the process now recommended, which was not quite novel, and it was good.

The PRESIDENT said last year they had been told how to cover the taste of cascara, and now how to remove it. He hoped the result would be that the million pounds of the drug annually consumed would be increased.

Mr. White's papers and the discussion on them had occupied exactly twenty-seven minutes, and at 3.45 the proceedings were closed for the day, twelve of the twenty-four papers thus being disposed of.

Wednesday, August 13.

THE meeting was resumed on Wednesday morning, a few minutes after 10 o'clock, when the PRESIDENT called upon the HON. SECRETARY to read a list of

ADDITIONAL DELEGATES.

Bradford and District Chemists' Association.—Messrs. Arthur Hanson (President), R. W. Silson (Vice-President), J. Jackson.

Manchester Pharmaceutical Association.—(Additional) J. T. Smith, Radcliffe.

Liverpool Chemists' Association.—Messrs. A. L. Abraham, John Bain, P. H. Marsden, T. H. Swinton, E. Evans, jun., Harold Wyatt, jun., R. C. Cowley, T. H. Wardleworth, C. Symes.

London Chemists' Association.—Messrs. Albert Cooper, Feaver Clarke, W. Watson-Will.

About fifty members were present at this stage, and others were coming in by dribblets.

A WORD OF SYMPATHY

then fell from the PRESIDENT, who said, that as probably many of them were aware, the Conference had indirectly sustained a severe blow since the previous day. One of the reporters—Mr. Duncan—who was well known to many of them, had had a very sad bereavement. His daughter and son were yesterday bathing at Crail, and both were drowned. He (the President) thought it only right to mention this, and he was sure they would all wish to tender their thanks to Mr. Duncan, and through him generally to the reporters, who had aided the Conference, for the admirable way they had done their work in previous times. He was sure he fulfilled all their wishes in tendering their great sympathy with Mr. Duncan in the very tragic bereavement he had suffered.

The President, continuing, said he regretted there was not a larger audience present to hear the paper which Professor Marshall had prepared on pharmaceutical education, which he felt sure would interest them all.

The following was then read:—

The Education of Pharmacists.

By C. R. MARSHALL, M.D.

(Professor of *Materia Medica and Therapeutics* in the University of St. Andrews).

He said the training of pharmaceutical students can be considered under three heads—(a) Simple apprenticeship, under indentures or not; (b) apprenticeship, followed by coaching; and (c) apprenticeship combined with a collegiate education. The main difficulty turns upon the meaning of coaching and of collegiate education. Coaching he suggested for this occasion as the rapid introduction of necessary facts into the mind of a student by a so-called teacher for the purpose of passing the Pharmaceutical Society's examinations—the immediate if not the main goal of life to the student of pharmacy. The method is comparable with cramming; and the two are usually combined. How anyone could undertake to teach within three months all the subjects of the Minor examination was to the author a mystery. It cannot be done. The mind requires a certain length of time

for the assimilation of new facts, and it requires carrying from the simple to the more complex by easy stages. Only in this way can anyone be really taught. The acquisition of a number of facts without logical connection is not education, any more than the disjointed parts of an apparatus is the apparatus itself. Assuming that the student has passed his years of apprenticeship in acquiring the rudiments of the business, very rarely is he prepared to pass the Minor examination at the end of his time. In part this is his master's fault. In too many cases apprentices are looked upon as cheap labour. Little time is given them for study; little care is taken to explain the processes they are asked to perform; and but little practice is given them in that most important branch of their education—the art of dispensing. This is not as it should be. A pharmacist, whatever the terms of agreement, is morally bound to teach his apprentices to the best of his ability, and to give him opportunity of attending scientific classes, but it is useless to expect a youth who has worked in a shop the whole of the day to be able to assimilate knowledge late at night. Either he must have a rest previously or he must attend classes earlier in the day.

It is impossible to lay down rules to meet all cases. The terms of apprenticeship, the class of apprentices, and certain other factors differ, not only in different, but in the same, parts. And this, and much more, makes the problem of pharmaceutical education a very difficult one. The master should advise the apprentice in his studies, allow him the necessary time for them, as well as for recreation, and should teach him as far as he can the principles of pharmacy. An apprentice should, in fact, be fairly equipped for the Minor examination when he has served his apprenticeship.

In a large number of cases, especially in a country town, it is impossible for an apprentice to attend classes during his apprenticeship. In that case the only way is to attend a properly conducted systematic course at a thoroughly equipped institution for over a year. This is collegiate education—that is, knowledge properly and systematically acquired, not simply a means to an end, unless this is the acquisition of knowledge itself.

The moral obligations under which a pharmacist labours with regard to his apprentices should be transferred to the schools. In other words, a would-be pharmacist should be properly trained previous to his apprenticeship—trained not only in botany, chemistry, and physics, but also in all that is comprised under the term *pharmaceutics*.

Much has been said lately of a degree in pharmacy which should be limited to pharmacists and called B.Sc. (Pharm.), and with this many of us are in sympathy. The author saw no great difficulty in the way, but he would delete the word "pharm." as unnecessary and cumbersome. It would be better for the pharmaceutical degree to come under the head of other degrees in departmental science. The regulations would then be the same as for any other degree in applied science. There would be the same Preliminary examination and the same First Science examination, the former being passed before matriculation, the latter at the end of the first year. The two succeeding years would be devoted to the subjects of the final examination—chemistry, botany, and *pharmaceutics* the last being taken on the higher grade, thus making the degree an honours degree. The botany would comprise all that is required for the Major examination of the Pharmaceutical Society, and the chemistry and *pharmaceutics*, this and something more. As regards *pharmaceutics*, he submitted a synopsis of a possible examination as follows:—

FINAL EXAMINATION.—PHARMACEUTICS.

- (1) *Materia Medica*.—Paper, *visà voce*.
- (2) *Pharmacy, including Law relating to Scheduled Poisons*.—Paper, practical (the making of pharmacopœial preparations, dispensing, &c.).
- (3) *Pharmaceutical Chemistry*.—Paper, practical (the preparation of pharmacopœial substances; assaying, &c.).
- (4) *Toxicology and the Analysis of Foods and Drugs*.—Paper, practical.

Professor Walker and he had drawn up the following syllabus:—

Elementary chemistry: Lectures, one hundred hours; practical, one hundred hours. Elementary physics: Lectures, one hundred

hours; practical, fifty hours. Elementary botany and zoology (each): Lectures, fifty hours; practical, one hundred hours. Advanced chemistry: Lectures, one hundred hours; practical (including water-analysis), three hundred hours. Advanced botany: Lectures, fifty hours; practical, one hundred hours. Pharmacy: Lectures, fifty hours; practical, two hundred hours. Materia medica: Lectures, fifty hours; museum work, variable. Toxicology: Lectures, twenty-five hours; practical, fifty hours. Analysis of food and drugs, one hundred hours.

The syllabus is open to criticism, but on the whole it seemed to him the best. He would like to see pharmacists—as they ought to be—the complements and helpmeets of medical men, and this can only be attained by following a course as suggested. He thought the course should be taken prior to apprenticeship—the most opportune time. At the end of his school-days a youth is more capable of being educationally trained than after years of apprenticeship, when the mind has lost some of its elasticity, and interest in other things has been aroused.

After his college career a student who wished to proceed with pharmacy would naturally enter a shop as apprentice. But the apprenticeship should be different in form from the present. The student, in a sense, is a skilled workman, and consequently worthy of his hire. All that he would require to know would be the routine of business, and this should be accomplished in a comparatively short time—in two years at the most. At the end of this time he should be entitled to pass the Pharmaceutical Society's examination, and afterwards to register.

This brought up a second point in connection with the degree. It is suggested that it should be limited to pharmacists. This the author thought a mistake. Not being a registrable qualification it should be open to anyone. It is very unlikely that any but those going in for pharmacy would take it, but it might prove useful to public analysts and others who desire a degree in these special subjects. That, far from diminishing its value, would considerably enhance it to pharmacists. Indeed, with such a training, there was no reason why pharmacists should not take up work of that kind.

One other important point called for consideration—viz., the question of expense. Is the remuneration worth the expenditure of time and money? He thought it is—in Scotland, at least. There, through the munificence of Dr. Carnegie, the college fees are paid, and with a little extra work a bursary, which keeps a student in books and clothes, can, without much difficulty, be obtained.

DISCUSSION.

Mr. S. R. ATKINS said it afforded him great pleasure to express his personal congratulations to Professor Marshall for the exceedingly thoughtful paper on a question which he considered was very germane to the Conference. Long years ago this question was taken up in the Conference, and, according to the light of that day, opinions, he ventured to say somewhat different to those of the professor's, were expressed and largely endorsed. But times had changed since George III. was king—(laughter)—and with the evolution of that change they must learn to adapt themselves. The professor had given them material for reflection, and he was largely in accord with him in the desire—a desire he (Mr. Atkins) had long cherished—that good scientific work should be done by the apprentice before his indentures were signed. In earlier days they regulated that preparation largely through scholastic or mere classical training, but the professor had carried the argument much further, and had laid stress upon that preparation in science. He was not surprised that that thought was given expression to in Scotland, which he ventured to say, as an Englishman, was generations ahead of them in the matter of education. (Applause.) They in England were slowly learning from what they saw north of the Tweed; but there were practical difficulties in the way in small provincial centres of carrying on this scientific training in the country. It was all very well to say—he did not think Professor Marshall had said it—that the master should be responsible for this training. Parenthetically, he wished to say that the whole question of apprenticeship was passing through the crucible of change, and therefore, largely, the men best qualified to train now declined to train, and what the Professor had very aptly called merely cheap labour was a consideration which very frequently in

the South, if not in the North, operated in securing apprentices. Could the necessary training be supplied outside educational centres? In the larger communities he knew it could be, but that did not apply to places of small population, and so, he feared, they must come back to this: unless they insisted upon a sound preparation as far as they could secure it in the school, and a business-preparation in the pharmacy itself, in many places scientific training must be limited to training in future days in their schools. With regard to those schools, he was entirely in accord with the Professor in what he had said about the evils of "cram," which was the reason why there was such slaughter in their examination-rooms. It was a most distressing thing to those who had to deal with it. It had come prominently before him, and one of the most acute considerations he had had was when he saw the disappointment of the apprentice and his friends when he attempted to pass in the examination-room, and, it seemed to him, there could be no remedy for that growing evil but slow, steady, and sound acquisition of knowledge. Call it by what name you like—if you call it curriculum, some will kick at it—he did not care about the name, he only wanted the reality, and the only preparation, what was of infinitely more importance for the sequence of life in the examination-room, was the sure and steady acquisition of that knowledge requisite for pharmacy. (Applause.)

Mr. NEWSHOLME, President of the Pharmaceutical Society, said he had the very greatest sympathy indeed with the views expressed by Professor Marshall, and he thought his friend Mr. Atkins had covered most of the ground which he (Mr. Newsholme) had intended to take. As a member of the Board of Examiners he knew what an enormous advance had taken place. The Pharmaceutical Council had been doing their best for a great number of years to try to bring about a somewhat systematic course of training for students before they came up. One realised, all the more since coming up to Scotland, what a proper system of education was, and the state of matters in Scotland as compared with England. The manner in which business was conducted in Scotland was a different thing altogether to the business which was carried on in their manufacturing cities in England. In Dundee he was quite sure the Professor would meet with a very sympathetic audience, but he was not quite so sure if he came down to Sheffield or some of the English manufacturing towns they would quite appreciate the words he had said that morning. They would like to see his views carried out, but there was another side to it. Some might be inclined to say *Cui bono?* What was the good of all this money being spent on the student before he became an apprentice? What was it for? What did the student gain? He knew his friend Mr. Atkins might say that education for itself was a grand thing. He (Mr. Newsholme) believed in that thoroughly, but they required something more. They wanted some privilege and some protection. (Applause.) It would not do for him to go into that matter, and even the Professor had been treading somewhat dangerous ground. With Mr. Atkins he believed there was a time coming when education even in England would be much better than at the present time. In their great cities—London, Liverpool, Manchester, Birmingham, and even Sheffield—they had universities and university colleges springing up, and many young pharmacists were availing themselves of the opportunities. And now they were bringing that system down to their towns and villages, and county councils and parish councils were doing their very best for providing some system of elementary education. The time was coming, when there would be better facilities for educating the people. He thought if the remarks of the Professor were taken to heart, and applied not only by the great universities but by county councils, some good would be done. He (Mr. Newsholme) was one of those who believed firmly that the better the pharmacist was educated the better chance he had of maintaining his position and rising to something better. (Applause.)

Mr. WATSON WILL said he regarded Professor Marshall's statements relative to examinations to be very important. He thought it was absolutely impossible to gain from the candidate in about three hours anything like the amount of information he had assimilated. Speaking personally, from what he knew of examinations that part which appealed

most forcibly to candidates—that was the practical examination—it was only right and fair that they should have all the instruments for the operations they were called upon to carry out. (Applause.) He knew candidates had been asked to prepare a 2-dr. quantity of hypodermic injection of morphine (B.P., 1885) in the examination-room, and was supplied with a 5-oz. measure. (Laughter.) He was in favour of the examination being conducted in a way that would permit of the candidate meeting all the requirements. Speaking of the educational side of the question, he said he remembered years ago of the cram drums being beaten from Wick or John o' Groats to Land's End, and not without reason. With the lapse of years there had been advance, and provincial education was now on a very different footing. The result was that they got candidates better prepared from a scholastic point of view. Relative to the education in the centres in England which had been referred to, his idea was that it was not in keeping with the demands of the pharmaceutical examination. There was such a thing as pharmaceutical chemistry, a thing that was ignored to an enormous extent. (Hear, hear.) In anything that would be brought forward relative to the education of apprentices he thought it was very necessary that the apprentice should have a certain amount of scientific knowledge before he entered upon the period of apprenticeship. At present they did not possess it before, and certainly did not acquire it during apprenticeship. It was not altogether the fault of the masters. As to the periods of time they should attend any particular course of instruction, their average course was about seven months, but when men had gone through a university training or technical classes they would turn out very much superior all round. The student had then more than the groundwork, and had practically to apply himself to the pharmaceutical aspect of the question. In the education, regard should be paid to the pharmaceutical aspect, and a course supplied in keeping with the synopsis of the examination. He thought it was Sir Henry Roscoe, who some years ago, addressing the students at Bloomsbury Square, made some very caustic and sarcastic remarks in reference to the examination-syllabus. It was modified, but yet it was a conundrum. There were two examinations, and it was very difficult to know to what length they were to educate the student for either of them.

Mr. JAMES MACKENZIE pointed out that at the present time the apprentice is trained under very different and generally very difficult conditions. The trade is apt to look on apprentices much as they look on postage-stamps—all alike. The fact must not be overlooked that pharmacy is at present in a crucial condition of change, and the training of the apprentice is neglected. He thought it would give greater confidence to young men going up for the examination and add to its fairness if an inspector were appointed to go round the various laboratories and see that instruments and other things are accurate. He thought also that the Pharmaceutical Society should see that proper remuneration is assured for the qualified men in order that a proper class of young men should be brought into the trade. The chemistry and pharmacy taught by the older professors was entirely unsuitable for pharmacy. In order to ensure a better condition of things, it is requisite to begin at the right end, and the right end is at Bloomsbury. (Laughter and applause.)

Mr. THOMAS MACKENZIE (Inverness) said this question of pharmaceutical education resolved itself into three points—first, the material they had to deal with, viz., apprentices. In the past they were the crudest possible, but the recent movement in regard to the Preliminary examination would, he hoped, bring better lads into the trade. The second point was, what did they offer assistants after apprenticeship. Not much, he feared, and they could not expect young men to go to the expense of educating themselves if the return was not better than it is now. The third point was, that the higher education now required of chemists would tend to solidify the craft; but they must not leap too far at once. His objection to Professor Marshall's scheme was that it left too little time for practical training in the shop, which was absolutely essential to pharmacy.

Mr. J. P. GILMOUR (Glasgow) said his sympathies were all with the doctrine of Professor Marshall's paper. The system of education we have at present is, he continued, in

a transition state, owing to the perversion of the Pharmacy Act, which made the seller of poisons the person who hands them over the counter. That had aborted pharmaceutical development in the better sense, for while pharmacy was controlled on the *laissez-faire* principle, and grew like the British Constitution—(laughter)—individuals sought education for its own sake. They must not forget that there are many capable masters who did their duty well to their apprentices, but the trouble was that the conditions of trade did not permit them to do it as they would like. In some places in Britain, even in Glasgow, a prescription was such a rare phenomenon that all those in the shop came forward to have a look at it. (Laughter.) The master's practical difficulty was, therefore, great. He (the speaker) insisted that the Preliminary examination should be passed before apprenticeship—(applause)—and thought that was no hardship now that the examination is a general one. Mr. Gilmour's own ambition was to get British pharmacy in the same condition as it is on the Continent. (Applause.) He would not trouble much about remuneration, for he agreed with Mr. Atkins that the better the pharmacist the better was his reward. (Hear, hear.)

Mr. N. H. MARTIN regretted that it had been his misfortune to be born south of the Tweed, but he desired to state that he had known men in England who had been imperfectly educated by dilatory masters, but who yet knew all that was worth knowing about drugs. He did not agree with Professor Marshall in his advocacy of a purely academic training for the pharmacist, nor did he altogether hold with those who advocated entirely the commercial side of the profession. In medicine the apprenticeship method had been abandoned—a fact which had been bewailed by scores of medical men in his presence. He had been told that many present-day medical men have to learn their business as medical practitioners after their qualification. He was of opinion that the pharmaceutical Preliminary examination had for a very long time been pitched far too low, and he urged a better general education and an examination to be passed when the student leaves school. Nowhere can pharmacy be learned but in a good pharmacy. There the student learns to wash a bottle and to handle measures and scales. As a rule, if these very necessary essentials are not taught until after the student comes back from the university, they are not learned at all. The scientific apprentice is generally far too big a man to do those menial things. He assured Professor Marshall that too long a contact with the scientific side spoils many men for the practical side of pharmacy; and it is the practical side of the business that counts, after all. (Hear, hear.) He (the speaker) would not take a B.Sc. as an apprentice, for he felt quite sure that he would not be able to teach the apprentice that most necessary of all things in preliminary pharmacy—how to wash a bottle. The most thorough training in the practical side of pharmacy is absolutely necessary for every pharmacist, and the highly scientific side must be left to the specialist. He should not like it to go forth that the pharmacist is a *rara avis* in England, and he thought it unwise to adopt a purely academic training for the pharmacist.

Mr. E. SAVILLE PECK said the paper had covered much ground. Mr. Watson-Will had related an incident in which a student in the examination-room had been asked to prepare a small quantity of hypodermic injection of morphine in a 5-oz. measure. Such a condition of things may have been possible some years ago, but he could assure the meeting that such a state of things was not possible at the present time. He wished to make it quite clear that students get correct and accurate apparatus to work with. He was afraid if men got a good preliminary training and then went on to the university for two or three years they would not return to pharmacy. During his visit to St. Andrews on the previous day he foregathered with a porter at the college, who thought the time had almost come when a tripos or final degree in lawn-tennis was a necessity for the modern student. (Laughter.) Thus he thought after two or three years at lawn-tennis the student would be loth to return to pharmacy. (Laughter and applause.)

Mr. J. C. C. PAYNE said they had heard much of the dunness south of the Tweed, and the cleverness north of the Tweed, but nothing had been mentioned of the pharmacists on the other side of the Irish Channel. The subject of education was, however, as interesting to Irish pharmacists as to

their English and Scotch brethren, and he thought, in order to obtain good apprentices, no indentures should be signed unless the apprentice had passed a Preliminary examination. Pharmacists should see to it that they engaged suitably educated young men for their apprentices.

Dr. COULL expressed the opinion that apprenticeship should come before academic education. He had often been thankful that he had learned to dust bottles and clean shop-scales before he went to the university.

Professor MARSHALL, replying on the discussion, said he had to thank the Conference very much for the way they had received his ideas, and also for the discussion that had ensued thereupon. There was evidently an idea abroad that he had no practical acquaintance with the subject. (Laughter.) He had to tell them that it was only by mischance that he was not sitting on the benches among them and being one of them instead of trying to give them some ideas upon the matter under discussion. (Hear, hear.) For a year he had happened to be in a chemist's shop in one of the large towns in the West Riding of Yorkshire, and, as he had said, it was only by a mischance that he did not go forward to examination and become one of them. It would thus be seen that he had some little practical acquaintance with the subject about which he was talking. He could only hope to give a few ideas of what he thought, and what he believed the education of pharmacists would come to, and what he believed it was coming to. They were in the condition of the medical profession in the early part of the last century, when apprenticeship was absolutely necessary. Very few would go back to the apprenticeship system—in fact, he might say distinctly; none of their best men had been in a condition of pupilage previous to going on to a university education. Further, there seemed to be an idea abroad that a man who had been trained in a university would not go into a pharmacy afterwards. He thought that was a great mistake. In a university education they did not simply stand and deliver lectures to the students before them, but they did all the practical work connected with their profession. They cleaned up bottles sometimes—(laughter)—they certainly cleaned all their measures; they learned to weigh and wrap up bottles—in fact, they did everything that was done in a shop, and did it in a properly systematic manner. He had every sympathy with Mr. Martin, and quite understood the point of view he was labouring under, but at the same time he did not see how the knowledge which was required generally was to be obtained in a pharmacy at the present time. One gentleman had spoken about a prescription being an extremely rare thing—in fact, that the men at the counter came to look at it. (Laughter.) They must know how to dispense in order that they might prescribe. In his own classes they started with the simplest things, and went on by gradual stages to the more complex; and he asserted that a man, if he had completed his curriculum, would be able to dispense any mortal thing sent out by any physician, however learned he might be. Concerning the remuneration of a man who had passed through a college course, it was not too much to say that he ought to be worth his keep. He did not think such a man would hesitate to do anything in a shop except very menial work. The same thing applied in engineering. So far as he knew, one did not experience any trouble with an engineer because he had had a university education. That was his ideal of a pharmacist's education, because he felt it would raise the status of pharmacists. A set of conditions had arisen in pharmacy which would never have occurred had pharmacists been careful. There was a talk of legislation. Legislation would come, not when pharmacists were better represented, but when the huge mass and the general average of pharmacy was raised to a higher status.

The PRESIDENT said he was afraid that just now they were rushing to put their people through one kind of hole, whether square or round. That, he thought, was a mistake.

The next paper was on

The Toxic Principles of the Coriariæ.

By Professor C. R. MARSHALL, M.D.

The Coriariæ order contains one genus and about twelve species, with a wide geographical distribution. The best known—*Coriaria myrtifolia*, L.—is found abundantly in the

countries bordering the Mediterranean, and others occur in the remaining three continents, especially in India (the Himalayas), the East Indies, China, and Japan; in the countries between the United States and Chile; and extensively in New Zealand. The European and New Zealand species have been most largely investigated. Of the others comparatively little is known.

Professor Easterfield, of Wellington, N.Z., and Mr. Aston isolated a crystalline substance from three of the New Zealand species of *Coriaria*. This substance Professor Marshall has examined physiologically. Previously, coriamyrtin, a crystalline principle isolated by Riban from *C. myrtifolia*, was known. This was formerly extensively used in tanning, but, except in Russia, it is much less used now.* The leaves have also been used to adulterate senna, and in this form have given rise to many fatal cases of poisoning. It is not so used now. According to Riban, the plant was known to Pliny, but its toxic properties are not mentioned until the beginning of the eighteenth century. Then a series of cases of poisoning was described, and since then the number has been largely augmented. From this plant Riban isolated a colourless crystalline principle. The commercial coriamyrtin of to-day is not that described by Riban. The melting-point given by Merck is 228-229° C., that of Easterfield and Aston's specimen is 225° C. (uncorr.), and that of the author's own 224° C. (uncorr.). The coriamyrtin supplied to the author was not a glucoside, and its solubility in water, far from being 1.44 per cent., was less than 1 in 1,000. Indeed, it crystallises out from this strength. Physiologically, however, it possessed a similar action to Riban's coriamyrtin.

Of New Zealand *Coriariæ* four species are described, and they are said "to vary to a remarkable extent, and should probably be referred to a single species." The three most important species are *C. ruscifolia*, L., *C. thymifolia*, Humb. and Bonp., and *C. angustissima*, Hook. *C. lurida*, Kirk., has no distinctive features beyond its lurid purple colour. These plants are known locally as "tu-tu" or "toot-plants." *C. ruscifolia*, or "tree-toot," is a shrub or small tree, with spreading branches and glossy succulent leaves and shoots. It grows to a variable height, being often 20 to 25 feet. In a single season even, robust shoots develop from the root-stock, which grow to the height of 6 to 10 feet. *C. thymifolia*, or "ground-toot," is herbaceous, and rarely grows more than 3 feet in height; usually it is little more than 1 foot. *C. angustissima* is also herbaceous. It occurs in broad patches, and is comparatively rare. The branches are very slender, and terminate in almost capillary-sized endings, and this with the numerous small leaves gives it a fern-like appearance.

From each of these plants Professor Easterfield and Mr. Aston have isolated the same crystalline active principle—"tutin"—by evaporating the filtered expressed juice of the finely divided shoots of *C. ruscifolia* to a syrup, nearly neutralising with sodium carbonate, and shaking up with ether. On allowing the ether to evaporate, crystals of tutin separated out. The process was slightly modified in the case of the other two species. The crude tutin was purified by crystallising it from alcohol until the melting-point was constant. This was found to be 208-209° C. (uncorr.). Tutin is slightly soluble in water and in ether, and moderately soluble in alcohol. One hundred grams of water at 10° C. dissolved 1.9 gram of tutin. It is a glucoside, and its formula is given as $C_{17}H_{20}O_7$.

Pharmacologically it possesses a similar action to coriamyrtin, so that the relation of the two, as well as the relation to Riban's coriamyrtin, is interesting. From molecular-weight determinations of the coriamyrtin now obtainable, Easterfield and Aston conclude that it has only half the formula given to it by Riban—that it is, in fact, $C_{15}H_{18}O_5$. The further relationship of these bodies has not been determined.

The main interest, commercially, about "tu-tu" is the loss of stock which it causes to settlers. In the springtime the plant sends up succulent shoots, resembling in some respects asparagus, and when other fodder is scanty these are frequently eaten by sheep and cattle just turned out into the open. As a consequence they often become "tooted." In this condition they are stupefied, or, especially if roused, they run wildly about, careless of obstacles, until exhaustion

* The plant is said to be used habitually by tanners for gleet.

sets in. Then not infrequently death follows. Lindsay, who visited the colony in 1863, says:—

One settler friend told me of his having lost by tooting 250 sheep; another 80 to 100 sheep of a flock of 400; a third seven of sixteen bullocks; a fourth, six of twenty-four cattle; a fifth, twenty-four cattle; a sixth, six of eight cattle; each of those instances in a single night. Another flock-master lost 400 out of a flock of 2,000, twenty-five being frequently dead of a night. In other words, he seemed a fortunate farmer or run-holder who had not lost more than 25 per cent., or a quarter of his stock, from toot-poisoning; while in some instances the losses were as high as 75 per cent., or three-quarters.

Poisoning is not confined to stock. Many men and children have lost their lives through eating the berries, which are moist and succulent, and resemble a blackberry. The symptoms are similar to those produced by *C. myrtifolia*. The chief are vomiting, convulsions, and stupor. Loss of memory, strange to say, has been noticed among those who have recovered. The poison of the fruit resides within the seeds; the juice appears to be harmless. From it the Maoris used to make a beverage, and they frequently quenched their thirst by sucking the berries through a cloth. The fruits of the *C. thymifolia*, however, when eaten immoderately by the inhabitants of Quito, are said, even when disburbed of their seeds, to produce a gay delirium, and to prove fatal after a certain time. *C. nepalensis* is said to be non-toxic. Its fruit, apart from the seeds, is eaten by the tribes inhabiting the Himalayas. *C. atropurpureus*, D.C., found in Mexico, is said to be powerfully poisonous. The toxic properties of the other species of *Coraria* are as yet unknown.

DISCUSSION.

Mr. GERRARD asked what was the nature of the principle isolated.

Professor MARSHALL replied that tutin is a glucoside.

Mr. GERRARD said that was rather curious, for it was isolated by adding sodium carbonate and shaking out an ether, a method used for alkaloids.

Professor MARSHALL said it was, but the shoots are acid, and sodium carbonate is added until nearly neutral. One of his objects in submitting the paper was to show chemists that there is in such subjects as this an opportunity for advanced research. The pharmacological action of tutin is rather interesting, and it is his intention to report on this later. The next paper read was on

Manufacture of Galenicals on the Retail Scale.

By JOHN H. THOMSON.

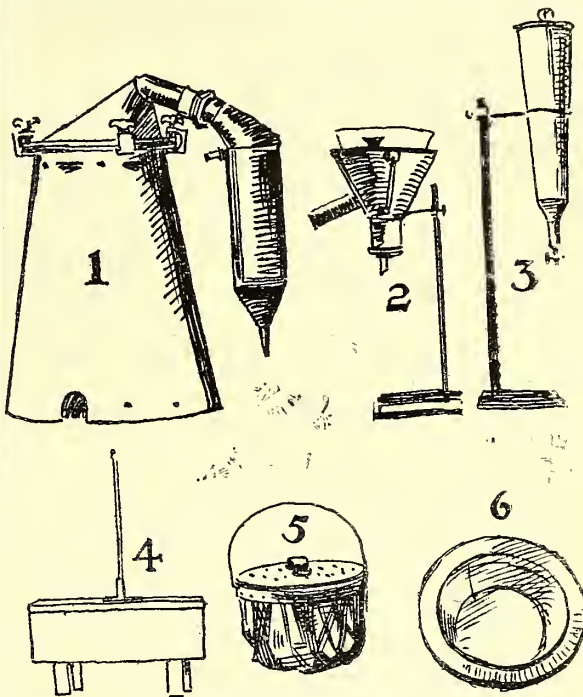
The opinion is widely entertained that galenical preparations can be manufactured with exactness and economy only on the large scale, and partly on account of this supposition, but also owing to changes in retail pharmacy on the commercial side during recent years, the retail chemist has abandoned one of his most important functions by purchasing most of his galenicals ready made. There may be conditions in which this practice is defensible—stress of competition and difficulties in respect to shop-assistance perhaps justifying a negative reply to the question, Does it pay to make galenicals? But the economy gained is of that order which may be expedient for the individual, but is destructive to the class. A bad feature about the matter is that the tendency is steadily becoming common to retail pharmacy as a whole, although there are numerous retail businesses to which it is not properly applicable, even on the principle of economy. The author referred to those, such as his own, where the customers are not the class amenable to present-day pushing methods, and the volume of business is in a great measure concentrated into a few hours of the day, so that much of the time is unoccupied. In such it is economical to make one's own galenicals; moreover, the practice of galenic pharmacy on the retail scale:—

(1) Turns to practical account the technical skill and knowledge acquired in student days, and employs them to the best advantage.

(2) Is a valuable means, and the only rational method, of training apprentices to perform those pharmaceutical operations which they must prove their familiarity with when they come before the Board of Examiners.

(3) Gives the individual pharmacist the satisfaction of supplying preparations which, to his personal knowledge, are free from adulteration and substitution.

Large manufacturers admittedly play an important rôle in the economy of the trade, and by specialised skill and fine appliances have done much to advance modern pharmacy. But there are many things which the retail



THE PRINCIPAL APPARATUS USED.

1, Still, 3-gal. capacity, of tinned copper. 2, Hot-water funnel, with gauge-tube. 3, Tin percolator, with brass tap. 4, Hot-air oven for drying residues. This is extemporised from a jujube-tin, the bottom and top being perforated with rows of small holes. 5, Copper-wire cage used for enclosing the drug when distilling cinnamon and dill waters. 6, Copper pan, tinned inside, 1-gal. capacity, used for evaporating purposes; it can also be fitted to the still-head and used as a boiler when the quantity to be distilled is small.

pharmacist ought to make for himself, and the author suggested the following amongst others, the notes being taken from his own laboratory-books:—

Distilled Water.—The freshness and purity of this are ensured by preparing it on the premises in an apparatus kept exclusively for the purpose. He distils 2 gals., the time occupied being three hours. The burner used consumes 25 cubic feet of gas per hour, at a cost of 3d. for the three hours.

Aromatic Waters are admittedly best prepared by distillation. Peppermint, cinnamon, and dill waters are thus made. The still used is a modification of Remington's, made locally, and it was exhibited to the meeting. Its principal feature is the altered position of the condenser, which is secured to the still-head by a vapour-tight screw-coupling, and requires no support, as its weight is more than counterbalanced by that of the boiler. Economy of space is secured by this modification. In making cinnamon or dill-water the drug is placed in a copper-wire cage, which rests upon the flat bottom of the boiler and protects the drug from partial burning. The waters are made in 1-gal. quantities, a smaller burner (consuming 12½ cubic feet of gas per hour) is used, and the time occupied is about five hours. The cost for drug and gas is, in the case of peppermint, 1d. per lb.; cinnamon, 2d. per lb.; dill, 1½d. per lb. In each case the distillate collected in a stock-bottle is found to be covered with a layer of oil, the waters being stored in this condition, and only filtered as required for filling up the shop-rounds.

Extracts form a class not well adapted for working on the small scale, and only a few experimental batches have as yet been attempted.

Liquid Extract of Cascara Sagrada.—From 20 oz. of bark treated according to the official directions, 1 lb. 5½ oz. of liquid extract was obtained, at a cost of 1s. 8d. per lb. Sp. gr., 1.080 at 15.5° C., and the yield of extractive (brittle and pulverisable) from 100 c.c. dried at 100° C. is 28 grams. A trade sample, said to be

made by an improved process, was examined for comparison. Its sp. gr. was 1.083, and 100 c.c. yielded a sticky residue (after drying for two hours at 100° C.) weighing 31.7 grams. The residue apparently contained glycerin.

Liquid Extract of Liquorice.—From 20 oz. of root, the volume of pressed and strained liquor obtained measured 63½ fl. oz. When this was evaporated to the required sp. gr., and the alcohol added, the finished product weighed 11 lb. The cost for material and evaporation was at the rate of 2s. 3d. per lb.

Liquid Extract of Ipecacuanha.—Sixteen ounces of root in No. 20 powder was treated as officially directed, and 13½ fl. oz. of strong percolate was obtained and set aside; percolation was then continued to exhaustion, and again after treatment of the marc with calcium hydroxide. The weaker percolates were evaporated and the residual extract dissolved in the reserved percolate, the combined volume being about 16 fl. oz. A portion was assayed by Alcock's method, which, begun the one morning, was with interruptions finished the next morning. Five cubic centimetres of the liquid gave a brown alkaloidal residue, weighing when constant 0.095 gram (=1.9 per cent.). By the B.P. method, with Bird's modification, 10 c.c. yielded 0.181 gram alkaloidal residue (=1.34 per cent.). The volume of liquid extract after assay was about 15 fl. oz., weighing 13½ oz., and the cost for root, alcohol used up, and gas consumed in recovering the alcohol was 18s. The finished product, therefore, cost 1s. 4d. per oz., or 21s. 4d. per lb.

Glycerin of Boric Acid is made by the official method, but is generally ordered to be diluted with 2 parts by weight of glycerin. Cost, 1s. per lb.

Glycerin of Tannic Acid.—Tannin 4 oz. and glycerin 22 oz., weighed in a dish and stirred, solution being promoted by gently warming over a water-bath. Product, 20 fl. oz.; cost, 1s. 2d. per lb.

Glycerin of Borax.—Borax 1 lb. and glycerin 7½ lbs. are weighed in a dish, stirred, and warmed on a water-bath till solution is effected. Powdered borax gives a dull product, which is quickly filtered bright through a hot-water funnel. Cost, 8d. per lb.

Mercury with Chalk.—Working with the official quantities, the mercury is extinguished with diligent rubbing repeated at intervals during the day. Three ounces is made for 3d.

Concentrated Compound Infusion of Gentian.—The percolation process described by Farr and Wright (*C. & D.*, Augst 3, 1901, page 137) has been tried, and the product is satisfactory. Sp. gr., 1.003. Extractive, dried at 100° C., 7 per cent. w/v. Its cost is 10d. per lb.

Concentrated Infusion of Senega.—The official concentrated liquor is first prepared, and then diluted, 4 parts to 5, with alcoholic menstruum used in the preparation of the liquor. So made, the concentrated infusion has sp. gr. 1.013, and 100 c.c. yields 10.4 grams of extractive, dried at 100° C. Cost, 2s. per lb. A trade sample examined showed sp. gr. 1.014, and 100 c.c. yielded 10 grams extractive, dried at 100° C.

Solution of Acetate of Ammonium.—Owing to variability of acetic acid and carbonate of ammonium, Hill's method is used, and one can make by it a solution of uniform strength at a cost of 2d. per pint.

A ½-litre flask is most convenient for preparing with exactitude the various dilute acids as well as the percentage solutions of arsenic, morphine, and strychnine.

Arsenical Solution.—Arsenious anhydride 5 grams is dropped into a funnel with a long stem placed in the neck of the flask. The potassium carbonate is added, and both are washed down into the flask with about 250 c.c. of distilled water. The clear solution is cooled, the tincture added, and the volume adjusted at 15.5° C. to 500 c.c. The volumetric test is then applied. It presents no difficulty, and forms an interesting object-lesson for the students apprentice. The product weighs about 18 oz., and costs less than 3d. per lb.

Solution of Bismuth and Ammonium Citrate.—Cowley and Catford's process yields a satisfactory solution with a minimum of loss. One litre (about 2½ lbs.) of solution so prepared shows sp. gr. 1.074, and, tested gravimetrically, contains the equivalent of 5.4 grams bismuth oxide in 100 c.c. It is produced for 8d. per lb.

Solution of Morphine Hydrochloride and Solution of Strychnine Hydrochloride.—Quantities made in the ½-litre flask weigh each 17½ oz. The morphine solution costs 1s. 8d. per lb., the strychnine 1s. 2d.

Concentrated Solution of Quassia is made at a cost of about 10d. per lb., and is used for the production of concentrated infusion (1 to 7). Its sp. gr. is 0.980, and the extractive yield, dried at 100° C., is 0.3 gram from 100 c.c.

Concentrated Solution of Senega.—Forty fluid ounces (weighing nearly 2½ lbs.) costs for root and alcohol 2s. 6d. per lb. Sp. gr., 1.019. Extractive yield, 12.2 grams from 100 c.c., dried at 100° C. The menstruum retained by the marc is pressed off, filtered, its acidity partly neutralised, and then used for diluting the solution to the strength of the concentrated infusion (1 to 7).

Compound Mixture of Senna.—The official black draught is

highly popular as a safe, speedy, and pleasant corrective. It is made in 4-gal. quantities at a cost of 5d. per lb. Four gallons of senna infusion is put on; 3 gals. is strained off, and ½ gal. reserved. The magnesium sulphate is dissolved in the other 2½ gal., and the rest of the ingredients added to the cold solution. The volume is finally adjusted with the reserved portion of infusion. The sp. gr. of the mixture is 1.120, and the extractive from 100 c.c., dried at 100° C., weighs 21.3 grams. From 100 c.c. distilled on a water-bath 15 c.c. of ammoniacal spirit was obtained. A trade sample examined had sp. gr. 1.150, yielded 28.5 grams extractive from 100 c.c., and 100 c.c. distilled gave 10 c.c. spirituous distillate, destitute of ammonia.

Compound Powder of Liquorice is made in a mixing and sifting machine, in batches of 24 lbs. at one time, at a cost of 9d. per lb. A tincture made from 5 grams in 70 c.c. of 70 per cent alcohol yields 4.5 per cent. extractive.

Aromatic Spirit of Ammonia.—Using the official imperial quantities, the mixture of essential oils, water, and alcohol is slowly distilled, all the joints of the still being carefully secured, and the condenser kept well chilled. Resublimed ammonium carbonate and ordinary "880" solution of ammonia are used. The product measures about 1½ fl. oz. less than a gallon. The official tests are applied. The author has not succeeded in keeping the sp. gr. lower than 0.397. Alkalinity = 25.8 c.c. normal sulphuric acid. The cost is about 2s. per lb. A trade sample from a newly opened Winchester had sp. gr. 0.904, and alkalinity equivalent to 26.3 c.c. normal sulphuric acid.

Syrup of Iodide of Iron.—One litre (about 3 lbs.) is made at a cost of 1s. per lb. The sp. gr. is taken and found to be 1.395, the volume having been adjusted with diluted syrup instead of distilled water. Ten cubic centimetres tested by B.P. process required 16.6 c.c. decinormal silver nitrate. The test, when applied to a sample containing a trace of hypophosphorous acid, was found to be unworkable.

Syrup of Phosphate of Iron with Quinine and Strychnine.—On account of its imperfect keeping properties, this should be made in small quantities and often. One litre (about 2½ lbs.) can be made at a cost of 8d. per lb.

Syrup of Lemon.—Twenty-eight pounds of lemons are purchased at a cost of 5s. 6d. These yield 4 lbs. grated peel (2s. 9d.) and 6 pints clear juice (2s. 9d.). Added to 96 fl. oz. of 90-per cent alcohol, the peel is converted into 6½ pints of strong tincture at a cost of 2s. 2d. per lb. Part of the tincture is used in the preparation of the syrup, the remainder in making concentrated infusion of gentian. In the juice, clarified by filtration through kieselguhr, is dissolved 12 lbs. of sugar. The solution is strained, and when cold is mixed with 10 fl. oz. of the tincture. Product, 20 lbs. of syrup of lemon of excellent quality at 4½d. per lb.

Syrup of Tolu.—The official process might well be replaced by the formula devised by Farr and Wright (*C. & D.*, July 29, 1899, page 212). Their liquor is easily made, and being a 1-to-7 preparation, is convenient. The syrup produced is very satisfactory, and costs only 4d. per lb.

Notwithstanding the advantage possessed by the large manufacturer over the small operator in being able with powerful machinery to extract the last drop of spirit from his residues, tincture-making may yet be profitably engaged in by the retailer.

Tincture of Opium.—Operating on 300 grams of opium, 1,945 c.c. of strong tincture was obtained, 80 c.c. of which was taken for assay. The proportion of anhydrous morphine in 100 c.c. of the strong tincture having been found to be 1.8 gram, the remaining 1,865 c.c. was diluted to 4,476 c.c. so as to contain 0.75 per cent. w/v of morphine. The weight of tincture of opium thus produced was about 9½ lbs., and the cost about 2s. per lb. Sp. gr., 0.950; yield of extractive, 3.35 grams per 100 c.c.

The following, amongst other tinctures, are also regularly made, the drugs used in their preparation being purchased entire, and reduced to the different degrees of fineness required by means of an "Enterprise" drug-mill and a set of sieves varying in mesh from Nos. 5 to 60. For those prepared by the percolation-process a conical tin percolator with brass tap is used.

Compound Tincture of Benzoin.—By the modified process of Merson (*Year-book*, 1901, page 179), 1 pint, weighing 18 oz., was produced. Sp. gr., 0.900; extractive yield, 20 per cent.; cost, 3s. per lb.

Tincture of Orange.—The shredded peel is bought in the season from a local confectioner, and converted into tincture at a cost of 2s. 6d. per lb. Sp. gr., 0.882.

Compound Tincture of Camphor.—Four pints (about 4½ lbs.) is made at a cost of 1s. 10d. per lb. Sp. gr., 0.919.

Compound Tincture of Caralamons.—Quantities for 2 gals. are taken. The yield is 15 pints 8½ fl. oz., weighing 18½ lbs. The cost is 1s. 9d. per lb. Sp. gr., 0.950; extractive yield, 8.2 per cent.

Tincture of Catechu.—Twice the B.P. quantities yield 41 fl. oz., weighing 2½ lbs. The cost is 1s. 8d. per lb. Sp. gr., 0.978; extractive yield, 14.4 per cent.

Tincture of Digitalis.—Two pints (about 2½ lbs.) is made at a cost of 2s. 1d. per lb. Sp. gr., 0.935; extractive yield, 4.15 per cent.

Tincture of Hyoscyamus.—Two pints (33 oz.) is made at a cost of 2s. 6d. per lb. Sp. gr., 0.957; extractive yield, 2.97 per cent.

Tincture of Myrrh.—Four pints (about 4½ lbs.) is made with gum. myrrh. parv. at a cost of 3s. per lb. Sp. gr., 0.355. Extractive yield, 5.65 per cent.

Compound Tincture of Rhubarb.—Two pints (about 2½ lbs.) is made at a cost of 2s. per lb. Sp. gr., 0.975. Extractive yield, 17.7 per cent.

Specific gravities are taken in a 10-c.c. stoppered flask at 15.5° C., weighed on a fine dispensing-balance. The contents of the flask are then rinsed into a tared tin dish, evaporated on a water-bath, and finally dried at 100° C. for one hour in a hot-air oven extemporised from a jujube-tin, the bottom and top of which are freely perforated. The oven is supported over a Doulton gas-stove, and the temperature regulated by means of a thermometer. The weight of residue multiplied by 10 indicates the amount of extractive contained in 100 c.c. of the tincture under examination.

Mercuric-nitrate Ointment.—This is made by Squire's process, as being more manageable than that of the B.P. A jar holding ten times the quantity does not prevent frothing over and some consequent loss. Working with twice the official quantities the yield was 24½ oz., costing 1s. 4d. per lb.

Zinc-oleate Ointment.—The washed cake of oleate is partly dried by expression, reduced to a coarse powder, spread on blotting-paper, and further dried by exposure to air in a well-ventilated room free from dust. For the cost of 4 oz. zinc sulphate and 8 oz. soap 6½ oz. of creamy-white oleate in No. 40 powder is obtained, which dissolves readily in an equal weight of melted soft paraffin, and forms a satisfactory ointment.

Ipecacuanha Wine.—Four pints is made from liquid extract (own make) and detannated sherry. Weight after filtration and assay about 4½ lbs. Cost 2s. per lb.

These examples show the practicability of producing on the small scale many galenic preparations satisfactory in point of character, and economical in point of cost. The prices quoted are based on cost of material only, and do not include any charge for time or apparatus.

DISCUSSION.

Mr. THOMAS TYRER said he was not a practical pharmacist, but he had the greatest appreciation for those who are, and considered it extremely desirable that good work such as this of Mr. Thomson's should be done. But it seemed to him that leisure was essential for it, and if one had leisure he had little business, or so much business that he had assistants to do the work. The question was, could they take such work as Mr. Thomson and recommend every pharmacist to begin business by making these things? Mr. Thomson had not taken into account what was of the greatest account to manufacturers—viz., time—and he (Mr. Tyrer) thought there ought to be in the retail drug-trade greater consideration when buying for the difficulties which the manufacturers had to contend with.

Mr. BIRD appreciated the spirit in which Mr. Thomson had prepared his paper. In the past it had been said that pharmacists should prepare their own galenicals in order to ensure their correctness, thus inferring that the retailer was an honest man—(laughter)—and the wholesaler — (Renewed laughter.) Mr. Thomson had done better than that by arguing that it was to the retailer's advantage to fill in his spare time and train his apprentices by making these preparations. That was a spirit they could all appreciate. (Applause.) As to the presence of glycerin in liquid extract of cascara, he had heard of that before, but had never met with such a specimen. He was pleased to note that in making an infusion of senega Mr. Thomson used the liquor from the marc to dilute the concentrated liquor. Of course the cost of the preparations was not arrived at when taking into consideration labour and apparatus, and it was well that should be emphasised.

Mr. MARTIN, while complimenting Mr. Thomson on the spirit in which he had conceived his paper, said that this was the first time that the Conference had attempted to publish a price-list, and, as the prices given by Mr. Thomson were most misleading, while the Conference was only concerned with the science of pharmacy and not with the commercial side, he suggested that if they were to put the price,

into the *Year-book* it would cause a considerable amount of friction. He appealed, therefore, to Mr. Thomson to withdraw that part of the paper.

Mr. MABEN said it was gratifying to hear a retail pharmacist reading a paper such as this. As long as they had men like Mr. Thomson in the trade, pharmacy was not going to die. He did not hear any reference by Mr. Thomson to the fact that a still-licence costs 10s. 6d., and he asked if that was taken into account in fixing the cost of distilled waters. He dissented strongly from Mr. Tyrer's view that this sort of thing could not be done unless one had a small business. There were businesses in the country, and he had had one of them, in which it could be done, and it was desirable that it should be. As to Mr. Martin's suggestion, regarding the figures, if they did not give them, they would cut out the best part of the paper. Similar figures were given every week in the *Pharmaceutical Journal* and in *THE CHEMIST AND DRUGGIST*, and nobody expected that they could buy small quantities at these prices.

Mr. TYRER: But they do.

Mr. UMNEY said that they could not discuss there the relations between the wholesaler and the retailer, and he desired to compliment Mr. Thomson for showing what could be done in this way in retail pharmacy. During his own apprenticeship with a master who had now gone over to the majority, he had been trained right from the bottom. The very first thing he had to do was to grind quillaia in a hand-mill, and he considered that that kind of training in the making of galenicals was better than any academic training they could get. The men who were trained from the bottom were the best.

Mr. J. R. HILL said that Mr. Tyrer's references to leisure in business was open to misconception. He knew many chemists who could do this sort of work and yet they had a fair business, and if pharmacy was not to become extinct this sort of thing must be done. Pure laziness was at the bottom of it not being more general. As to not publishing the figures, he failed to see how it was possible to bring the subject forward without them. Mr. Tyrer gave the qualification that the prices did not include the cost of time and apparatus, and he himself saw some advantage, for if a species of dishonest wholesaler was to arise Mr. Thomson's prices would be a good check upon that.

Mr. UMNEY referred to Mr. Hill's remarks stating that the wholesaler frequently gave a written warranty or guarantee, and he maintained that his honesty was equal to that of the retailer. (Hear, hear.)

Mr. JAMES MACKENZIE submitted that the pharmacist's duty was to make as many preparations as possible.

Mr. PAYNE thought it was not in the interests of the Conference that the prices should be published.

Mr. W. L. HOWIE felt sure that Mr. Thomson's position was not that his preparations were cheaper than those of the wholesaler, but that it was in the interests of pharmacy that retailers should give their apprentices every opportunity of acquainting themselves with pharmaceutical processes. Mr. Howie did not think the publication of the prices would do any harm to those specially interested in the matter, but Mr. Martin's point might be considered in relation to its bearing upon the scientific purposes of the Conference.

The PRESIDENT, in summing up the matter, said he was afraid that Professor Marshall's discussion of the morning before had left a trail of the serpent. (Laughter.) The reference to prices reminded him of an incident that happened when he was staying in a nobleman's house. A discussion on agricultural depression was taking place, when a lady said she could not understand what the farmers had to grumble about, as she was getting a good return from the home farm. "Yes, my dear," said her husband, "you do not pay any rent—(laughter)—and I pay the wages." (Great laughter.) The principle of that might apply to Mr. Thomson's prices. The President was of opinion that a rough apprenticeship, in the course of which these things were made, was a very good training for pharmacists, and in his pessimistic moments he felt inclined to think that an academic training could not do what a practical and business training did. The object of such work as Mr. Thomson had treated of was to save pharmacists from degenerating into mere hucksters.

Mr. MARTIN remarked that he was the senior Vice-Presi-

dent present, and he wished to assure the Conference that the question of *£ s. d.* was more apt to divide men than anything else, and in his whole experience he had heard of nothing exactly of this nature brought before the Conference. He trusted that Mr. Thomson would see his way to withdraw the figures.

Mr. THOMSON replying, said it was impossible to touch upon all the points mentioned by the various speakers, but he thanked all for the sympathetic remarks made. When he compiled his paper it was certainly not his intention to show that pharmacists pay more for preparations obtained from wholesalers than they could be made for in the pharmacy. He had fortunately never been disappointed either in the price or quality of the galenicals he had obtained from his wholesale friends. His object was simply to show that the work could be done without loss, as the argument had often been put forth that such preparations could not be made remuneratively. With regard to the publication of the prices he had no particular desire that they should appear in the Press.

Mr. MABEN then read an abstract of the following:—

Official Recognition of Antidiphtheria Serum.

By THOMAS MABEN, F.C.S.

Before a new remedy can be introduced into the national Pharmacopœia two conditions have to be met. Stating the position in the abstract, we ask affirmative replies to these questions: First, has the therapeutic value of the remedy been placed on a perfectly sure foundation—in other words, has it passed the experimental stage? Secondly, is its importance such that it demands recognition by insertion in the Pharmacopœia?

When we apply the principle in a concrete case, such as that under consideration—viz., antidiphtheria serum—there may be brought forward objections based on conditions that do not apply when we are dealing with ordinary natural or synthetic products. But in regard to the two questions, for example, as to the first, antidiphtheria serum has passed the experimental stage, and its therapeutic value has been recognised by the medical profession. The latest statistics available on a fairly large scale are those of the hospitals of the Metropolitan Asylums Board. For the five years—1890–1894—preceding the antitoxin period the death-rate from diphtheria in the hospitals under that Board was 29.6 per cent.; in the five years following the introduction of antitoxin the death-rate was 16.9 per cent. The actual saving of life during this period was 3,703, or about 740 per annum. In Glasgow, in one hospital alone, the death-rate has been reduced to less than half, with a saving of life of 40 per annum during the last seven years. Taking the British Isles all over, the introduction of serum means that probably 10,000 lives are being saved every year. The capital value of a life has been computed at 15%, and if this figure be accepted it is clear that the introduction of this remedy is adding every year to the capital value of these islands no less than 150,000!. The same reduction in the percentage of fatal cases has been obtained wherever, throughout the world, the antitoxin-treatment has been resorted to, and it may, therefore, be taken for proved that the serum-treatment has now passed the experimental stage, and that, so far as diphtheria is concerned, serotherapy has been placed in an unassailable position.

Answering the second question, the author appealed to individual experience of the terrible ravages caused by the disease not so many years ago, and submitted statistics regarding the efficiency of serum-treatment. Thus, in one Glasgow hospital it is reported that eight cases were admitted on the first day of the disease, and all recovered; twenty-two cases were admitted on the second day, and the mortality was 9 per cent.; fifty-eight cases were admitted on the third or fourth day, and 15.5 per cent. died; while ninety-six, or more than half the total, were admitted on the fifth day and upwards, the mortality being 19.8 per cent. These figures seem to indicate that when diphtheria is treated on the first day with serum, death need rarely occur. In view, therefore, of all these circumstances, it will surely be universally admitted that the remedy is of the very first importance, and just because of its importance it is all the more necessary that every precaution should be taken to

ensure that the remedy will be all the time and every time absolutely above suspicion.

The author glanced at the objections which may be advanced to the admission of serums to the Pharmacopœia, chiefly the difficulty of the pharmacist in testing such remedies, the methods required being practically outside the pharmacist's experience. The same applies to the production of the serums, and applies equally to the wholesaler and retailer. The work of testing would have to be entrusted to a central official laboratory. The recent startling disclosures in the *Lancet* with regard to vaccine-lymph constitute a painful commentary on our boasted advancement in applied medicine. If the sale of serum continues on its present footing, can any one of us be bold enough to say that it never can happen that the *Lancet* may one day again be compelled to publish another report on serum similar to that published in 1895, which went to show that the antidiphtheria serum on the market at that time was, to say the least, extremely unsatisfactory?

He considered official testing necessary. The tendency is to administer the serum in much larger doses than formerly. With a rapidly increasing demand it is possible that we may have increased sources of supply, and those sources may not all be above suspicion. On the Continent and in America there have been on three separate occasions a number of deaths due to tetanus by the use of impure serum. What guarantee is there that a similar calamity might not occur here? The author considered, therefore, that it is absolutely necessary that some precautions ought to be taken to ensure the unquestionable character of antidiphtheria serum.

Assuming that the serum were to be introduced into the Pharmacopœia, the following questions naturally arise: How should the serum be described? Should tests be applied for its identification, to ascertain whether it is bacteria-free, and to determine its antitoxin-strength? Should an antiseptic be prescribed for its preservation, and, if so, what percentage? Should a qualitative and quantitative test be given for this antiseptic? And what about the storage and sale of the serum? In order to guide us a little in considering these points, he quoted the statement in the German Pharmacopœia of 1900 as follows:—

The blood-serum of horses that have been immunised against the toxin of diphtheria. It is placed on the market by authorised factories after being tested by the Royal Prussian Institute for Experimental Therapy at Frankfurt-am-Main, as to strength in units of immunisation, as to its freedom from bacteria, and as to its contents in preserving-material (phenol or trikresol), and after having been authorised for sale it is placed on the market in fluid and solid form. Fluid and solid antidiphtheric serums are sold only in vials officially sealed, and upon the labels of which are entered the place of manufacture, the content of antitoxin per c.c., as well as the whole content of the vial, the test number, and the date of official test. These vials are contained in light-proof packages, upon the outside of which the same data are recorded. The seals are marked on one side with an eagle or a lion; on the other with a number of immunisation units contained in the entire amount.

Liquid diphtheria antitoxin is a yellowish, transparent fluid, having the odour of the preserving-agent, and with, at most, only a slight sediment. It comes in vials of various sizes and colour, the contents of which represent from 100 to 3,000 immunisation units. The sizes most used are No. 0, 200 immunisation units; No. 1, 500–600 immunisation units; No. 2, 100 immunisation units; No. 3, 1,500 immunisation units. Diphtheria antitoxin, which contains more than 300 immunisation units in each c.c., is classed as a high-potency serum.

The solid diphtheria antitoxin is a dried, high-potency serum, containing at least 500 units per gram, and free from antiseptic or other foreign additions. It consists of a yellowish-white powder or yellow transparent lamella, which, by the addition of 10 parts of water, dissolves to a liquid corresponding in colour and general appearance to the liquid diphtheria antitoxin. It is to be sold in white glass-stoppered vials of a capacity of from 2 to 6 c.c. each, containing single doses of from 250 to 1,000 units. The solution is to be made freshly when needed, in the original vials, by the addition of 1 c.c. of sterilised water for each 250 units. This solution should be clear except for small floccules of albumen, and is to be delivered in original bottles. Antitoxin with marked permanent cloudiness or with copious sediment, as well as antitoxin bearing a test-number which has been ordered to be withdrawn, is not allowed to be sold in the pharmacies. To be preserved in a cool place, and protected from light.

It will be observed that in this monograph no tests whatever, for general use, are specified. The tests are made

officially, and every vial is certified as to immunisation strength or potency, freedom from bacteria, amount of anti-septic-content of vial, and the date of the test. In this way the retailer is completely protected, save in the case where he has stocked too heavily, and may have serum on hand out of date, in which event he stands to lose on the transaction.

The author then considered each point in the monograph, explaining how the tests are applied, and so on. Speaking of the age of the preparation—perhaps the most important point to the man who sells it—he said it is well known that antidiphtheria serum deteriorates with the lapse of time. The cause of this has not yet been ascertained, but the deterioration is by no means uniform. As a general rule it may be stated that very little deterioration takes place within the first six months, and many bulbs of serum have been tested after a year, and even much longer, which have shown comparatively little deterioration. At the same time it is also known that in other instances considerable deterioration has taken place, and so far as our present knowledge of the subject goes it is impossible to state on a label what will be the actual potency of a bulb of serum at any future date. The utmost that we can do is to make sure as far as possible that the serum shall always be *above* the dose specified on the label, and for that purpose the best way is to add at least 25 per cent. more serum than the quantity actually required to give the labelled dose at the time of bottling. If this be done there is good reason for believing that the dose stated on the label will always be available, providing the contents be used within nine to twelve months. Considering all the conditions of the case, the author concluded that antidiphtheria serum ought to be officially recognised in the Pharmacopœia, taking the German Pharmacopœia plan as the basis of recognition. It may not be practicable, and certainly is not essential, to have a Government laboratory for the preparation of serum, but it is perfectly practicable to have a laboratory where all needful tests could be carried out and where arrangements could be made to have the serum filled and every container properly certified by the official appointed for the purpose. This official might be appointed by the Government or by the General Medical Council, and he ought to be a man of eminence as a bacteriologist and pharmacologist whose certificate would be accepted absolutely without question.

DISCUSSION.

Mr. MARTIN pointed out that the committee appointed by the Pharmaceutical Society had no voice whatever as to what should be introduced into the Pharmacopœia.

On the motion of the CHAIRMAN, Mr. Maben was cordially thanked for his paper.

The next read was

Liquor *Krameria* Conc., B.P.

By F. C. J. BIRD.

Concentrated solution of *krameria*, B.P., occupies a prominent position in that section of the concentrated liquors of the Pharmacopœia which, on their first introduction, gained an unenviable notoriety on account of proneness to deposit and general unsatisfactory nature. As has been shown, however, in a previous paper communicated to the Conference, this undesirable tendency to change on keeping, at least as regards *senega* and *calumba*, can, by comparatively simple modification of the respective formulas, be entirely overcome, and it was thought probable that an inquiry into the causes which might be supposed to contribute to the want of stability of the *krameria* liquor would lead to useful results.

Liquor *krameria* conc., carefully prepared by the official process, is a clear liquid of a deep ruby-red colour in thin layers, with a characteristic odour, and having, when freshly made, a sp. gr. of from 1.007 to 1.016. On dilution with water it either precipitates or forms a cloudy solution. The extractive varies from 7 to 10 grams per 100 c.c., and the alcohol is usually about 18 to over 19 per cent. by volume. Change often commences within a few days after preparation: the liquid loses its brightness, becomes opalescent, and finally throws down a reddish-brown precipitate, which increases in volume with time. Under certain conditions

the liquid has been known to become gelatinous and nearly solid. The deposit can be redissolved in warm 20-per-cent. alcohol.

Experiment indicated two principal causes as being answerable for precipitation—viz., development of acidity and decrease of temperature. To confirm this observation a sample of liquor *krameria* conc., B.P., was prepared as follows: It was first found that the moisture in Peruvian *rhatany-root* reduced to No. 40 powder was 8.9 per cent. Sufficient extra 90-per-cent. alcohol was then added to the portion of menstruum used for moistening the *krameria* to convert the moisture into 20-per-cent. alcohol, any possibility of clouding of the first percolate due to extraction with a weaker alcoholic menstruum being thus avoided. The process was continued according to the B.P. in an apparatus so arranged as to avoid loss of alcohol. The finished product was quite brilliant, and possessed the following characters: Sp. gr. 1.015, alcohol 19.46 grams per 100 c.c., and extractive 10.38 grams per 100 c.c. After 1 pint had been collected (using B.P. quantities), percolation was continued to exhaustion, the percolate being collected in fractions of 10 fl. oz., and the amount of extractive in each determined in order to ascertain the effectiveness or otherwise of the B.P. method in its application to *krameria*:—

—	Extractive, grams per 100 c.c.	Percentage of Extractive re- moved, taking Total Soluble Matter in Root as =100
20 fl. oz. liq. <i>kramer.</i> conc., B.P. ...	10.38	69.9
10 fl. oz., first fraction ...	3.5	11.8
10 fl. oz., second fraction ...	2.38	8.1
10 fl. oz., third fraction ...	1.48	4.9
10 fl. oz., fourth fraction ...	0.84	2.8
10 fl. oz., fifth fraction ...	0.46	1.5
10 fl. oz., sixth fraction ...	0.3	1.0

It will thus be seen that the B.P. process extracts about 70 per cent. of the available soluble matter of the root, and in this instance is not so efficient as in the case of *senega*, which yields by the same method over 95 per cent. of its soluble constituents. (*Year-Book*, 1901, page 426.)

The Effect of Excessive Acidity in Promoting Decomposition.—Liq. *krameria* conc. is naturally acid in reaction, owing to the presence of *rhatania*-tannic acid, which, with *rhatania*-red, probably takes part in any change which the liquor may undergo. Although the glucosidal nature of *rhatania*-tannic acid is open to doubt, it is, nevertheless, decomposed by dilute acids with production of *rhatania*-red, a substance of difficult solubility. The addition of a little acetic acid to liq. *krameria* conc., B.P., causes considerable precipitation after twenty-four hours, and it is reasonable to suppose that the development of extra acidity does affect the keeping qualities of the preparation.

The Influence of Changes of Temperature.—Liquor *krameria* conc. prepared at 60° F. is apparently a fully saturated solution of one or both of the principal constituents of the root. This view is borne out by the fact that such a liquor cooled to 50° or 45° immediately becomes turbid, and if the temperature be still further lowered to near freezing-point, precipitation may be sufficiently copious to cause the consistency of the liquid to verge on the gelatinous. When, therefore, this preparation is subjected to a low temperature for some time, a precipitate falls to the bottom of the vessel, and from its position does not re-dissolve when the temperature of the liquid rises again. Thus a pharmacist's stock of liq. *krameria* conc., stored in a place where temperature is variable, must from this cause be continually losing strength, and there may also be in some cases a diminution of extractive, due both to a decrease in the alcoholic content of the liquid and also possible decomposition of *krameria*-tannic acid (with formation of the more insoluble *krameria*-red, by development of excess of acidity through fermentation changes. The instability of liq. *krameria* conc. was pointed out some time ago (*C. & D.*, January 5, 1901), by Bascombe, who particularly condemned the *rhatany*

liquor, and stated that it had been aptly described as "an excellent coaguline." The figures given were as follow:—

Sp. gr.	Extractive after 1 week	Extractive after 1 year
1·008	7·47	5·17

It may be interesting here to record the figures obtained from the recent examination of a very carefully prepared sample made soon after the issue of the present Pharmacopœia, and now over three years old:—

Sp. gr. (1899)	Sp. gr. (1902)	Grams per 100 c.c. Extractive (1899)	Extractive (1902)
1·013	1·001	9·1	5·9

Other commercial samples examined on various occasions also show great variation, e.g.:—

Sp. gr., 0·998, 1·008, and 0·996.
Extractive, 5·3, 6·84, and 4·4 per cent.

This want of uniformity is doubtless due to the causes already considered, and not necessarily to faulty preparation in the first instance.

From a consideration of the foregoing facts, the only likely method of improvement appeared to lie in the incorporation with the finished B.P. product of some better solvent of the constituents of krameria than the B.P. menstruum, which additional solvent should be capable of maintaining the solution permanent at all temperatures. After some preliminary experiments, the following processes were tried:—

PROCESS A.—A sample of liq. krameria conc. was prepared exactly as described in the earlier part of this note, but the first $\frac{1}{10}$ of the percolate was reserved, the remaining $\frac{9}{10}$ being collected separately, evaporated on a water-bath to a soft extract, and taken up in sufficient 90-per-cent. alcohol to give the required final volume when added to the reserved percolate.

PROCESS B.—As A, but glycerin in the proportion of $\frac{1}{10}$ of the finished volume added to the last $\frac{9}{10}$ percolate, the mixture evaporated on a water-bath, and dissolved in the reserved percolate. Contains about 5 per cent. glycerin.

PROCESS C.—As B, but with $\frac{1}{10}$ only of the percolate reserved, and double the amount of glycerin used. Contains about 10 per cent. of glycerin by volume.

The products of the various processes were then compared as follows:—

—	Sp. Gr.	Extractive Grms. per 100 c.c.	Alcohol by Vol.
B.P. ...	1·015	10·38	19·46
Process A ...	1·012	10·3	22·8
Process B ...	—	—	—
Process C ...	1·045	20·92	17·2

ACIDITY.—Samples slightly acidified with acetic acid, and allowed to stand for a few days.

B.P. product ...	...	Considerable precipitate
Process A (5 per cent. alcohol) ...	...	Slight deposit
Process B (5 per cent. glycerin) ...	...	Very slight deposit
Process C (10 per cent. glycerin) ...	...	Brilliant—no deposit

TEMPERATURE.—Samples exposed to a temperature of about 32° F.

B.P. product ...	Copious turbidity and precipitation
Process A ...	Turbidity and precipitation, but in less degree
Process B ...	Turbidity
Process C ...	Remains clear, no precipitation

On dilution with water there was distinctly less cloudiness with the samples containing glycerin, whilst the taste was rather more agreeable and the astringency practically the same. Glycerin has evidently a very notable solvent effect on those principles of krameria which readily fall out of solution in the B.P. preparation, for the solid deposit collected from an old sample of liquor formed a permanent solution in warm 20-per-cent. alcohol containing a little glycerin. Without glycerin the solution became turbid, and reprecipitated on cooling.

Samples kept under ordinary conditions since the date of preparation some months ago exhibit similar differences, the

B.P. product having thrown a precipitate, whilst "C" is free from deposit and quite bright. A and B are intermediate.

Conclusions.—Precipitation and loss of extractive characterise liq. krameria conc. when prepared by the B.P. method at the usual temperature of the laboratory and stored under ordinary conditions. Such changes may be attributed chiefly to variations of temperature, and probably in some instances to decrease in alcoholic strength with development of extra acidity.

If the introduction of any other solvent but alcohol be open to objection, then a decided improvement results from the incorporation of about 5 per cent. extra alcohol in the B.P. product, care being taken to avoid loss of alcohol during manufacture. But if glycerin be considered admissible in this preparation, then by far the best results are obtained by Process C (containing about 10 per cent.), the product of which possesses all the good qualities that the present B.P. liquor has been shown to lack. The advantages of 5 per cent. of glycerin (Process B) are not sufficiently marked to warrant its recommendation.

DISCUSSION.

Mr. J. C. UMNEY asked whether Mr. Bird had determined the nature of the action of the glycerin on the constituents of krameria. The peculiar effect of glycerin in precluding pectinisation in preparations of kino was well known, but it was singular that the solid residue in these cases did not correspond with what was naturally expected. The kino appeared to hold a portion of the glycerin while another portion had been dissipated. Probably a similar reaction took place with krameria preparations.

Mr. J. R. HILL said glycerin did not prevent pectinisation in kino-preparations, and the solid substance that remained was no longer kino. It had little astringency, and was easily soluble.

Mr. BIRD, in reply, said the point brought forward by Mr. Umney had occurred to him when working out his experiments. He tasted the treated krameria occasionally during the processes, and he fancied that the astringency gradually became less, but he was not quite clear on the point. He imagined that there was some chemical combination, as in the case of kino-preparations.

The Conference then adjourned for luncheon.

The members came back slowly from the Queen's Hotel; but about 2.10 the PRESIDENT was able to resume the proceedings with the following communication:—

New Apparatus for Milk-analysis.

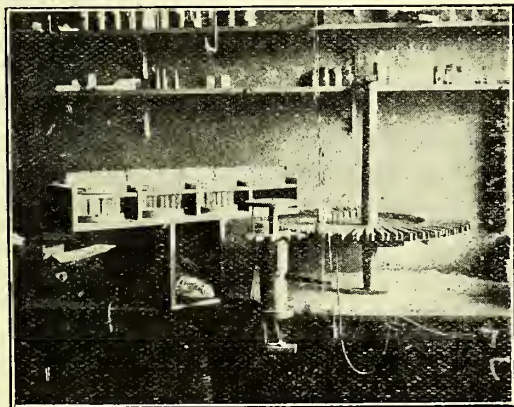
By G. D. MACDOUGALD, F.I.C., Public Analyst for Dundee, &c.

Attempts to fill the gap between purely laboratory methods of milk-analysis and the old methods as used in dairy factories have practically been confined to methods involving the use of centrifugal machines for volumetric estimation of the fat. These volumetric processes have not been considered so reliable as those in which the fat is separated and weighed, and are looked upon in the analytical world very much as a dentist might look on a steam-machine for extractions, or as a pharmacist might look on a penny-in-the-slot dispensing-apparatus. Yet the author thinks that, in the hands of an operator fully cognisant of possible sources of error, centrifugal methods are reliable. Any doubt about results obtained by centrifugal machines arises from the fact that they are, as a rule, worked by persons not so skilled in analytical manipulation as to inspire confidence. The fact that the apparatus is supposed to be workable by any person having had half-an-hour's instruction is sufficient to raise suspicion in the mind of such a superior person as an analyst.

For many years the author has endeavoured to invent new apparatus, having in view greater rapidity and consequent cheapening of the work of the professional milk-analyst, without sacrificing accuracy. He has endeavoured to divert work into the laboratory of the professional analyst, which is best done there, but which hitherto has been done outside. He has tried to improve, and render more automatic, the already quick centrifugal or volumetric methods. He has also spent a good deal of time at the quickening of gravimetric processes of which the Adams is the type, and also processes of which the Werner-Schmidt is the type. His

attempts in the last-mentioned direction were the subject of this communication. To the work of the machines, which he described, no exception, he thought, could be taken by the most critical analyst. The machine, or series of machines, has already assisted in the performance of nearly 20,000 analyses of milk in two years, and the results are, if anything, more reliable than the ordinary standard laboratory-work, because all the milks are treated by the apparatus in precisely the same way, and idiosyncrasy of hand-operation is to a large extent eliminated.

From one point of view the machines have a fault. They are complicated and have as many parts as two or three typewriting-machines put together, and are, therefore, more costly than most milk-apparatus. On the other hand, they do their work perfectly and are open to no objection on the question of accuracy. To anyone who has experience of the Adams or Werner-Schmidt process, it may appear a difficult problem to evolve an apparatus for gravimetric work based on one or other of these processes and of sufficient rapidity to enable an analyst to help clients wishing his assistance at such fees as the industry can afford. The author believed he has in a sense solved the problem. He showed the Conference by means of a lantern a number of diagrams, from which the following has been selected as sufficient to give a fairly clear idea of his apparatus.



MILK-ANALYSIS MACHINE.

In the illustration may be seen two toothed wheels provided with means for gearing with each other. The larger of these wheels is provided with as many teeth as the number of samples to be operated on at a time. The apparatus shown is constructed to work forty-eight or any less number at a time. Each tooth of the large wheel is capable of holding a tube containing a milk under treatment. The smaller wheel may conveniently have twelve teeth. Above the small wheel is a circular platform supported by a central shaft moving freely in the boss of the small wheel. This platform is capable of moving step by step with the wheel and also capable of movement vertically. Its vertical movement is regulated by a tapering piece of metal seen somewhat lower down to the right. Between the great and small wheel there may be observed, suspended by a cord, the eductor, which consists of two parts—one for closing the mouth of the tube containing the milk-assay and communicating air under pressure to the surface of the liquid by means of the tube seen in the diagram. The other part consists of a tube, called the "eductor-tube," of fully 1 mm. bore and capable of sliding nearly air-tight in a vertical direction through the portion of the apparatus closing the assay-tube orifice. This narrow eductor-tube is also capable of slight rotation about its vertical axis. The top of the eductor-tube is bent over until it is vertically within the circumference of the platform on the top of the small toothed wheel. To the left of the diagram may be seen on a specially constructed shelf eight circular trays holding each in position twelve marked and tared beakers of small size; ninety-six beakers are shown, equivalent to twice the number of assays that the great wheel will accommodate. This permits of the operator running up to ninety-six milks without stopping the apparatus for cleaning.

The manipulation is as follows: On a specially constructed balance (not shown) gravities are taken. A specially graduated pipette is used to transfer 5 grams of each milk to bulb-tubes: 48 or any less number are thereafter treated with a definite volume of acid and are boiled together in a pan. From the boiling-pan they are transferred to the great wheel and "ethered," a definite volume of ether being added. The wheel is rotated to facilitate the operation. A motion on the wheel, which is soon acquired, causes the heavy bottom liquid to mix with the ether. Water is added to bring the mark of separation to a narrow neck on each tube. A circular tray, with its complement of beakers, is now placed on the platform, and as this platform is rotated each beaker receives from the eductor-tube the fatty ethereal solution corresponding to its number. To prevent over-running during rotation—that is to say, for instance, to prevent the ethereal fatty solution of No. 13 being inadvertently run into No. 1—a stop, seen in the diagram, arrests the platform at the completion of every revolution, when a new tray is substituted, and so on until the last milk is treated. The whole now receive a second, and if not closely separated, a third ether. The beakers are now placed together in a distilling-apparatus and the ether recovered. They are subsequently heated and weighed.

DISCUSSION.

Mr. NAYLOR asked how long a time it occupied to do the heating-process when the acid was brought in contact with the milk, and how did they know exactly when the heating-process was accomplished, and beyond which overheating would result? He also asked whether the milk had to be heated longer provided it contained a larger quantity of casein?

Mr. TYLER asked what was the motive-power used for the apparatus?

Mr. MACDOUGALD said there was practically no difference between his process and the Werner-Schmidt process as regarded preliminary boiling. Anyone who had worked with the Werner-Schmidt process knew that there was a very considerable latitude in the boiling. They had simply to boil and observe when the fat came to the top and the globules were dispelled. When that happened they could stop the boiling. The usual time was eight minutes, but the other day he found a tube had been boiled about fifteen minutes and it was all right, because he repeated it. With reference to the motive-power, he at one time kept a boy to blow with an ordinary pair of hand-bellows, but as boys were a nuisance to get when one wanted them—(laughter)—he screwed on an ordinary tap, and got, with an ordinary aspirator, as much draught as he wanted.

The PRESIDENT proposed a vote of thanks to Mr. Macdougald for his interesting paper.

Mr. TYLER: And may the time come soon that he will receive a guinea per analysis! (Laughter.)

The PRESIDENT: As Chairman of a sanitary body, I cannot second that. I should say reduce it to a shilling. (Laughter.)

The next paper read was on

Bismuth Salts in Mixtures.

By EDMUND WHITE, B.Sc., F.I.C.

During the revision of the St. Thomas's Hospital Pharmacopoeia a series of experiments was undertaken to devise a more satisfactory formula for a bismuth mixture than the one in use, viz.:—

Bismuth oxynitrate	...	...	15 gr.
Sodium bicarbonate	...	...	15 gr.
Mucilage of gum acacia	...	...	1 fl. dr.
Water to	...	...	1 fl. oz.

Apart from evolution of carbon dioxide, the deposit in the mixture changes its appearance, the minutely crystalline bismuth salt finally forming lumps which are not afterwards evenly diffusible by agitation. This is due to the gum acacia, and the substitution of compound tragacanth powder improves matters somewhat, but the deposit becomes slimy and unsightly. It was found, after effervescence, that the filtrate from the mixture was reduced in alkalinity to an extent corresponding to the disappearance of nearly

4 gr. of sodium bicarbonate. A sample of the mixture, omitting the mucilage, gave the following results:—

(a) If filtered immediately after mixing, the filtrate possessed the full neutralising power of the bicarbonate.

(b) After one hour, effervescence being finished, 25.6 per cent. of the bicarbonate had been neutralised, corresponding to the nitric acid of the bismuth oxynitrate.

(c) The precipitate contained 8.49 per cent. of combined carbonic anhydride, which indicates that the whole of the oxynitrate had been converted into oxycarbonate of the official formula.

It has been sometimes stated that bismuth oxynitrate given in this way is, therapeutically, more efficient than the oxycarbonate, but no definite evidence in support of this was obtained. When bismuth salts are given with compound infusion of orange-peel, no suspending agent is necessary; the infusion is, in fact, an ideal vehicle for bismuth mixtures. With water or aromatic waters as vehicle, 1 gr. of simple tragacanth powder per fl. oz. as suspending-agent is better than either gum acacia or compound powder of tragacanth. The author then, working on the idea that the value of bismuth salts depends upon the formation of a sedative coating on the gastric mucous membrane, aimed to get a preparation containing the bismuth as finely divided as possible, and produced the following formula:—

Glycerinum Bismuthi Carbonatis.

Bismuth oxynitrate	60 grams
Nitric acid	40 c.c.
Water	25 c.c.

Dissolve the oxynitrate in the acid mixed with water, and pour the solution into a solution containing—

Ammonium carbonate	55 grams
Water	300 c.c.

Collect the precipitate on a calico filter, wash well, drain, and rub the moist precipitate with glycerin a sufficient quantity to produce 100 c.c.

Each 30 minims of this contains about 15 gr. of bismuth carbonate, which is easily diffused in the glycerin by agitation. This may be prescribed with water, aromatic water, or compound infusion of orange-peel, and the suspension is perfect in each case without any addition of gum owing to the minute state of division of the bismuth salt. This glycerin of bismuth carbonate forms an ideal cosmetic for irritable conditions of the skin, and should also constitute a useful toilet-preparation.

DISCUSSION.

Mr. TYRER said that Mr. White's paper was at the present moment of especial interest. As one of a number of manufacturers of bismuth preparations, he noticed that in recent years the tendency had been to prescribe bismuth carbonate. Time was when bismuth carbonate was heavier than the oxynitrate, but since the demand for the carbonate had so largely increased manufacturers had endeavoured to produce as light a salt as possible. They must remember that in chemistry the phrase "strictly pure" was largely a phrase. They must not forget how long a time it took Staas to find the equivalent atomic weight of silver, and this ought to apply to the other elements. It had come to pass, however, that within the past three years increasingly superior preparations of bismuth carbonate had been produced—so much so that to send out now heavy carbonate was to bring down condemnation from the customer. He held that the bismuth salts did not require the adventitious aid of mucilages. He did not dispute the fact that the glycerole of bismuth produced by Mr. White was an excellent preparation, but he should not forget that it was not particularly easy to deal with an emulsion or glycerole of bismuth which contained an element of nitric acid.

Mr. JAMES MACKENZIE said doctors insisted on prescribing subnitrate of bismuth with bicarbonate of soda, but there is a growing tendency to order the carbonate.

Mr. GERRARD said from a therapeutic point of view the action of bismuth was more mechanical than otherwise. It seemed to act on the coating of the stomach, but the stomach contained acids, and it would be easily understood that acids acted more readily on the carbonate than on the subnitrate. He had experienced the same mechanical difficulty in the diffusion of subnitrate in mixtures, and had urged the authorities for whom he dispensed at the time to use the

mucilage of tragacanth instead of acacia for the diffusion of bismuth salt.

Mr. J. R. HILL said there were distinguishing differences between subnitrate and subcarbonate of bismuth. The subnitrate is more astringent, and this astringency appeared to be desired by therapeutists. Further, they must not forget that the subnitrate of bismuth is by no means insoluble. It dissolved much more rapidly than the subcarbonate.

Mr. PETER BOA said if Mr. White had settled by his formula the vexed question of this bismuth combination, he had occasioned a distinct loss to journalistic literature. The matter had been discussed for years. One section of the critics said the heavier salt was the better to use, while another said the lighter was preferable. He was inclined to think there was something to be said on both sides. In mixtures such as that under discussion it is well to remember that there is in the one case a distinct alkalinity, in the other there is none. He agreed with Mr. Rutherford Hill that bismuth subnitrate dissolves more readily than the subcarbonate in water. That may arise from some condition in the course of manufacture. With the oxynitrate there is always a more or less acid condition. He held the opinion that all suspending-agents for bismuth salts are bad. With a reasonably light salt of bismuth there is no necessity for a suspending-agent. All pharmacists will have noticed that oxynitrates vary considerably in density, and the tendency in practice is to use the lighter salt.

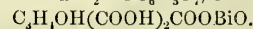
Mr. WHITE said he had endeavoured to trace the origin of the formula and the reason for its preference amongst prescribers, but had not been able to do so.

Mr. HILL was then called upon to read the following:—

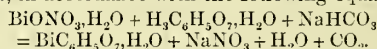
Bismuth Citrate and Liquor Bismuthi.

By WILLIAM DUNCAN, Ph.C., F.C.S.

The author in his communication supplemented the paper published in THE CHEMIST AND DRUGGIST, May 31, 1902, by giving the evidence on which he bases the statement that so-called bismuth citrate really plays the part of a dibasic acid having the formula $\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7$, or



The hydrogen of one of the carboxyl groups is displaced by the radicle bismuthyl, BiO , and the compound is therefore bismuthyl-citric acid, analogous to the antimonyl-tartaric acid of tartar emetic. The bismuth citrate, as already explained in the *C. & D.*, is prepared by mixing bismuth subnitrate, citric acid, and sodium bicarbonate, in molecular proportions, in accordance with the following equation:—

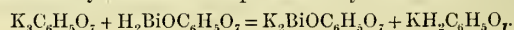


The difficulty created by the known variableness of commercial bismuth subnitrate is overcome by a preliminary quantitative analysis; or it may be obviated by using a slight excess of citric acid. Excess of NaHCO_3 must be avoided, as it causes a relatively high loss by forming a soluble sodium bismuthyl citrate.

Bismuth citrate (bismuthyl-citric acid) so prepared is micro-crystalline, very insoluble in water or alcohol, slowly soluble in dilute mineral acids (the solutions not readily precipitating on dilution with water), soluble in alkaline citrates (the solutions becoming acid), forming clear solutions with effervescence in alkaline carbonates and bicarbonate, and readily soluble in hydroxides of the alkalis.

The acid character of bismuth citrate was suggested by observing the reaction between it and Na_2CO_3 . Molecular weights of the citrate, $\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7$, and Na_2CO_3 give with effervescence a clear neutral solution in water, which does not precipitate on boiling; but two molecules Na_2CO_3 with one of the nitrate give a clear alkaline solution which precipitates oxycarbonate of bismuth on boiling. With $2\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7 + \text{Na}_2\text{CO}_3$ one-half of the former remains undissolved as unchanged bismuth citrate.

These results are satisfactorily explained on the assumption already indicated that the compound called bismuth citrate is really bismuthyl-citric acid. When molecular weights of bismuth citrate and neutral potassium citrate are gently heated in water, the following reaction takes place, being confirmed by titration with potassium hydroxide:—



The acid nature of bismuth citrate was further confirmed by preparing the silver, lead, and barium salts. All these were found to contain bismuth citrate in combination with the metal. The barium salt treated with ammonium sulphate gave barium sulphate, and the bismuth citrate again passed into solution as an ammonium salt. A quantity of the barium salt which (assuming $\text{BaBiOC}_6\text{H}_5\text{O}_7$, as the formula) should yield 1.476 gram Bi_2S_3 and 1.341 gram BaSO_4 , actually gave 1.502 gram and 1.311 gram respectively. Bismuth citrate previously dried in a sulphuric-acid desiccator lost 5.13 per cent. H_2O on heating to 110°C . The 1885 Pharmacopœia gave the formula $\text{BiC}_6\text{H}_5\text{O}_7$ for the citrate, and said it contained $2\frac{1}{2}$ per cent. of absorbed moisture, but the formula $\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7$ contains equal to 4.33 per cent. of combined H_2O . Proof:—

1.5 gram $\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7$ gave on ignition 0.8372 gram Bi_2O_3 . $\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7$ requires 0.839, while $\text{BiC}_6\text{H}_5\text{O}_7$ requires 0.865.

1.501 gram gave 1.018 gram Bi_2S_3 and 0.6619 gram $\text{H}_3\text{C}_6\text{H}_5\text{O}_7$. $\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7$ requires 0.92 and 0.692 respectively, while $\text{BiC}_6\text{H}_5\text{O}_7$ requires 0.96 and 0.725 respectively.

The dibasic character of bismuth citrate (bismuthyl-citric acid) was determined as follows:—

0.2758 gram $\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7$ combined with 0.026 gram NH_3 . Theory requires 0.22.

0.298 gram combined with 0.081 gram KOH . Theory requires 0.073.

0.7669 gram combined with 0.149 gram NaOH . Theory requires 0.145 gram.

Four grams $\text{H}_2\text{BiOC}_6\text{H}_5\text{O}_7$ gives a clear aqueous solution with 0.8 gram lithium carbonate, 1.7 gram sodium bicarbonate, and 2 grams potassium bicarbonate. The solutions are precipitated by barium nitrate, and the precipitate, when treated with the respective alkali sulphates, undergoes decomposition, the citrate again passing into solution as an alkali bismuthyl citrate.

Bismuthyl citrates of the alkalis are fairly soluble in water, especially the lithium and ammonium salts. Magnesium bismuthyl citrate and the bismuthyl citrates of the alkaline earths are much less soluble. All are precipitated from aqueous solutions by alcohol, apparently in an anhydrous condition.

Bismuthyl citrates of sodium and ammonium have been prepared in the form of crystals. Analogous salts of bismuthyl-tartaric acid have also been prepared, and the author is of opinion that all organic salts of bismuth which give clear solutions with hydroxides of the alkalis, such as bismuth gallate and bismuth tannate, will prove to be really bismuthyl acids.

After reference to his process suggested in THE CHEMIST AND DRUGGIST for preparing liquor bismuthi, the author stated that the superior medicinal value of the liquor lies apparently in the ease with which bismuth citrate is precipitated from solution by the acids of the stomach as a bulky easily disturbed powder. This is well illustrated in the following:—

Bismuth subnitrate ...	...	...	2 dr.
Citric acid ...	...	...	2 dr.
Water to make ...	...	...	8 fl. oz.

The bismuthyl-citric acid as it forms is very bulky, and takes months to settle, so that suspending-agents are quite unnecessary.

The author is of opinion that the official title for the liquor is misleading, and to be chemically correct should be "liquor ammonii bismuthyl-citratiss." The title "liquor bismuthi" would not commit to any theory as to constitution. He also pointed out that the statement in the official characters and tests, "heated with alkalis evolves ammonia and yields a white precipitate" should read "heated with excess of alkalis," as precipitation entirely depends on sufficient alkali being added not only to liberate the ammonia, but to decompose the bismuth citrate.

By this time the lecture-theatre was nearly filled, at least 150 ladies and gentlemen being present. Condensation became the order of the day, the rest of the papers being read in abstract.

The first one to receive this treatment was that by Dr. Jowett and Mr. Potter on "Variations in the Occurrence of Salicin and Salinigrin in Different Willow and Poplar Barks," which we shall give next week.

Solanum Dulcamara.

By FREDERICK DAVIS.

In consequence of uncertainty as to whether the fruit of *Solanum Dulcamara* is poisonous or not, the author has made some experiments, from which it appears that the fruit contains an alkaloid similar to that obtainable from belladonna. He has generally used fresh specimens collected upon the Surrey hills, thus growing, of course, upon chalk with bed of gravel. The assaying-methods employed were those indicated in Dragendorff's "Plant-analysis." The substances separated were (a) solanine and (b) solanidine (alkaloids), (c) solanein (glucoside), and (d) dulcamarin (bitter principle). *Solanine* was removed from its salts in aqueous solution by amyl alcohol, finally crystallising in four-sided prisms having a melting-point of 235°C . The taste is bitter, with subsequent burning sensation to the tongue and back of the mouth. The alkaloid gave an alkaline reaction with litmus. Solanine does not appear to be soluble in water except very sparingly, but the sulphate, hydrochloride, and bimalate are freely soluble; indeed, the alkaloid exists in the ripe fruit as bimalate. The bulk of the acid of the fruit was proved to be monohydroxy-succinic acid. The percentage of solanine found in the ripe fruits in ten separate determinations varied between 0.3 and 0.7. The reactions for solanine as found are as follows:—

Phospho-molybdic Acid.—Canary-coloured precipitate.

Potassio-bismuthic Iodide.—Red precipitate.

Froehde's Reagent.—Red, becoming brown, finally yellow.

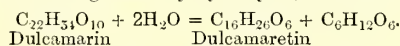
Concentrated Sulphuric Acid.—Ruddy yellow.

Alcohol and Sulphuric Acid.—Red when warmed. Does not reduce Fehling's solution.

Solanidine was found chiefly in the leaves and young shoots; but it also exists in the fruits—in fact, it would appear that solanidine is the prior alkaloidal product, and that solanine is the ultimate product. Solanidine is soluble in alcohol, whereas solanine is practically insoluble, excepting in boiling alcohol of sp. gr. 0.840. The salts of solanidine are slightly soluble in water. Solanidine was removed by chloroform from an alcoholic extract of the plant. It crystallises in brilliant acicular form, has a bitter and acrid taste, and a melting-point of 205°C . Hydroxide of potassium, sodium, or ammonia precipitates solanidine as a gelatinous mass.

Solanein.—Some little trouble was experienced with this substance, found in the alcoholic extract with the solanidine; it finally remaining as a non-crystallisable body, horny in character, and of a yellow colour. Solanein is a glucoside, and has a melting-point of 208°C . When boiled with very dilute sulphuric acid or hydrochloric acid it breaks up into solanidine and grape sugar. Solanein reduces Fehling's solution.

Dulcamarin exists throughout the plant, as evidenced by exhausting the root, stems, leaves, and fruit separately with acetic ether, then precipitating with basic lead acetate. It is at first taste intensely bitter, gradually giving place to a sweet and not unpleasant flavour, exactly the reverse of what the name implies. It does not answer the general tests for alkaloids, but dissolves in alkali hydroxide with a ruddy-brown colouration. It gives a rose-pink colour with concentrated sulphuric acid. It is readily soluble in alcohol, and by boiling with dilute sulphuric acid is broken up into dulcamaretin and glucose by hydrolysis, as follows:—



The literature upon *Solanum Dulcamara* shows that all authorities speak of dulcamarin, and appear to consider this bitter principle to be the active agent of the plant—some even stating it to be an alkaloid. The author pointed out that it yields none of the characteristic reactions, neither does it form salts with dilute mineral acid, but if boiled with dilute sulphuric acid or dilute hydrochloric acid grape-sugar is produced, and Fehling's solution is reduced. It is, therefore, a glucoside, as well as a bitter principle.

Some diversity appears to exist respecting the formula of solanine. Firas gives $\text{C}_{31}\text{H}_{52}\text{NO}_{18}$, whilst Hilger is of opinion that $\text{C}_{42}\text{H}_{73}\text{NO}_{13}$ represents it. The author finds the formula to approximate the latter, three separate workings giving by average $\text{C}_{42}\text{H}_{73}\text{NO}_{12}$.

Solanidine is said by Hilger to have the formula $\text{C}_{23}\text{H}_{41}\text{NO}_2$;

Firbas gives $C_{30}H_{61}NO_2$. Three separate determinations by the author yielded an average of $C_{31}H_{61}NO_2$.

Solanine.—Firbas gives the formula of this as $C_{32}H_{63}NO_{13}$. After repeated experiments the author obtained $C_{33}H_{78}NO_{13}$. In any case this glucoside contains nitrogen.

After these researches had been completed, a sample of solanine was obtained from a well-known German firm, and, compared with that obtained from the fresh plants as previously indicated, it was found that in taking the melting-point, which approximated $235^{\circ}C.$, a sublimate occurred in acicular crystals; subsequent treatment proved these crystals to be solanidine. It seems, therefore, that commercial solanine is a mixture of solanine and solanidine.

Deci- and Centi-normal Solutions: Limits of their Reliability.

By R. C. COWLEY and J. P. CATFORD.

The facility with which volumetric titrations can be performed is apt, sometimes, to inspire an exaggerated idea of the accuracy of the results. Measurements such as $\frac{1}{10}$ and even $\frac{1}{20}$ (0.05) of a c.c. are sometimes reckoned on as if absolutely correct. As this note is addressed to pharmacists, the authors took, by way of illustration, the B.P. process for alkaloidal assay of belladonna tincture and extract. The quantity of decinormal acid measured being proved by the balance to be uncertain to several centigrams, the variations in the case of the centinormal soda amount to as many tenths of a c.c., and the apparent gain in precision by using the centinormal solution is invalidated. An error of 50 milligrams of decinormal acid equals about 0.0015 of belladonna alkaloid, or 3 per cent. of the quantity contained in 100 c.c. of tincture assayed. The measurement by pipette of the decinormal solution restricts the variation to 1 centigram, provided care be taken to wipe the part that has been submerged before adjusting to the mark, and allowing more than half a minute for draining; but, as commonly used, the variations would be three to five times as much, and, besides, the 10-c.c. pipette is scarcely likely to be used for comparing the two solutions. It would not take much longer to weigh the acid than to pipette it carefully. The soda would then, for example, be labelled "1 c.c. = 0.098 gram $\frac{N}{10}$ HCl at $24^{\circ}C.$ " In the comparative trials given below, tincture of cochineal was used as the indicator, but the B.P. tincture was diluted with nine volumes of 45-per-cent. alcohol, in order to use a measured volume each time (1 c.c.), and a blank standard with water only to ensure the same tint. In other trials, not quoted, methyl orange was used—3 c.c. of B.P. solution diluted to 100 c.c. (1 c.c. = $m\frac{1}{2}$). The variations were quite as great. The pipette-fuls were weighed in a stoppered flask (which was not emptied and dried each time), instead of singly, in a beaker, as recommended by Sutton.

Temperature 23° to $25^{\circ}C.$

	$\frac{N}{10}$ HCl	Grams	$\frac{N}{100}$ NaHO	Acid from Pipette
Burette calibrated	10 c.c. = 9.991	= 101.7 c.c.		... 10 c.c. = 9.991 grams
	4 " = 3.965	= 40.4 "		... " = 9.994 "
	4 " = 4.006	= 40.8 "		... " = 9.996 "
	4 " = 4.016	= 40.1 "		... " = 9.997 "
	4 " = 4.022	= 41.1 "		... " = 9.999 "
Burette not calibrated				
	4 c.c. = 3.964	= 40.1 c.c.		
	4 " = 3.979	= 40.1 "		
	4 " = 3.990	= 40.2 "		
	4 " = 3.995	= 40.4 "		
	4 " = 4.005	= 40.4 "		
Pipette calibrated				
	4 c.c. = 3.964	= 40.1 c.c.		
	4 " = 3.979	= 40.1 "		
	4 " = 3.990	= 40.2 "		
	4 " = 3.995	= 40.4 "		
	4 " = 4.005	= 40.4 "		

Pharmacy Notes.

By R. WRIGHT.

Liquor Bromo-Chloral Compositus.—The author reported that medical men in his locality have dropped prescribing this preparation because of its excessive acidity, its uncertain effect, and the large dose required in comparison with that of other preparations of the kind. He has looked into the subject, and the following are the alterations which he suggested should be made in the Formulary preparation:—

1. Increase the amount of chloral and bromide to 15 gr. each in each fluid drachm, and substitute sodium for potassium bromide.
2. Omit the filtration, which takes out the resins of the Indian hemp. Add a little mucilage to suspend the resins and retain them.

3. Delete the henbane-juice, and substitute hyoscyne hydrobromide $\frac{1}{100}$ gr. in each fluid drachm.

4. Increase the quantity of liquid extract of liquorice to mask the taste of the chloral and bromide and minimise the acidity—due to the Indian hemp.

The following form is drawn on the above lines:—

Take of—

Chloral hydrate	...	...	2,400 gr.
Sodium bromide	...	...	2,400 gr.
Tincture of Indian hemp	...	...	440 minims
Hyoscyne hydrobromide	...	...	$\frac{1}{2}$ gr.
(= solution 1 per 1,000, 440 minims.)			
Syrup of orange	...	...	4 fl. oz.
Mucilage of acacia	...	...	1 fl. oz.
Liquid extract of liquorice	...	...	2 fl. oz.
Distilled water sufficient to make	...	...	20 fl. oz.

Place the chloral hydrate and sodium bromide in a mortar, add $6\frac{1}{2}$ oz. distilled water, the syrup of orange, and solution of hyoscyne hydrobromide; triturate till solution is complete; add the mucilage of acacia, and gradually the tincture of Indian hemp. Then add the liquid extract of liquorice, and adjust the volume to 20 fl. oz. by means of distilled water. If necessary, strain through tow.

Each fluid drachm contains 15 gr. each of chlor hydrate and sodium bromide, $\frac{1}{2}$ gr. extract of Indian hemp, and $\frac{1}{100}$ gr. hyoscyne hydrobromide.

This preparation, under the name of liquor bromidi compositus, has given general satisfaction to medical men who have prescribed it.

Camphorated Oil.—The number of prosecutions for the sale of camphorated oil deficient in camphor induced this note. The author stated that linimentum camphoræ, B.P., is an almost saturated solution of camphor in olive oil, and that if the proportion of camphor be increased by 25 per cent. some of it will crystallise out in very cold weather.

The process of solution of the camphor in the oil may be expedited either by the employment of heat or by the addition of a liquid in which camphor is more soluble and which is miscible with the oil. Frequent agitation also assists solution very appreciably. If heat is employed, it is important that the oil be not freely exposed to the air during the process. The rapidity with which the volatilisation of the camphor may take place is well illustrated by the following experiment:—

Two fluid ounces of camphorated oil was introduced into a dry pint flask, and a thermometer inserted through the open mouth of the flask, so that the bulb was immersed in the oil. The flask was then placed on a water-bath, the bottom dipping into the water, and heat was applied to the bath. The temperature of the oil was $59^{\circ}F.$ Sublimation of camphor commenced at $85^{\circ}F.$ In five minutes the thermometer registered $91^{\circ}F.$, and a dense crystalline deposit had begun to form inside the flask above the level of the liquid. The temperature gradually rose to $100^{\circ}F.$, and was maintained at this point for half an hour. At the end of that time the whole of the exposed surface of the flask was covered with a sublimate of camphor in crystalline plates. Heat was again applied, and the temperature raised to $160^{\circ}F.$, at which point it was maintained for two hours. The flask was then removed from the water-bath, and the amount of the sublimed camphor, roughly estimated, showed a loss of about 18 per cent. of the camphor. Fifteen per cent. more was lost on reheating at 180° for an hour.

The following method of making camphorated oil has proved the most satisfactory with the least trouble:—

Take of—

Camphor in flowers	...	...	4 oz.
Olive oil	...	...	16 fl. oz.

Place the camphor in a dry bottle, add the oil, previously heated to $160^{\circ}F.$ ($71^{\circ}C.$), shake frequently till solution is effected.

Working in this way, the camphor dissolves quickly, and the process is completed in from one to two hours. The same result might doubtless be effected by the aid of solvents. Thus 4 oz. of flowers of camphor will readily dissolve in $1\frac{1}{2}$ fl. oz. chloroform, and this solution is miscible with olive oil in all proportions. The addition of a much smaller proportion of chloroform is, however, sufficient to induce very rapid solution of the camphor in the oil. If, for example, 1 fl. dr. of chloroform be added for each ounce of camphor, the solution of the latter in the oil can easily be effected in the cold in half an hour, if the mixture is shaken occasionally.

Alcoholic Extracts.—In a note contributed to an evening meeting of the Pharmaceutical Society, Farr and Wright drew attention to the advantages of extracts prepared from

dried drugs by treatment with alcohol, and subsequent evaporation of the tincture, particularly as substitutes for the "juice" extracts. They gave the average yield per lb. of the dried drug, and also the amount of alkaloid contained in the finished product. Mr. Wright has prepared a second batch of extracts with menstrua of other strengths, weaker in the case of the leaf extracts, and stronger in the case of colchicum, with the following results, compared with those of 1897:—

Extract	Menstruum	Yield per lb.	Percentage of Alkaloid
Aconite-leaf ...	1897 = 70 p.c.	2½ oz.	0.60
Aconite-root ...	1897 = 70 p.c.	4 oz.	2.44
Ditto ...	1902 = 45 p.c.	5 oz. <i>soft</i>	1.22
Belladonna-leaf ...	1897 = 70 p.c.	4 oz.	2.83
Ditto ...	1902 = 45 p.c.	4 oz.	2.00
Conium-fruit ...	1897 = 70 p.c.	not calculated	*8.13
Ditto ...	1902 = 45 p.c.	2½ oz. <i>soft</i>	*7.00
Colchicum-root ...	1897 = 50 p.c.	2½ oz.	1.67
Ditto ...	1902 = 70 p.c.	not calculated	2.10
Colchicum-seed ...	1897 = 50 p.c.	2 oz.	3.16
Ditto ...	1902 = 70 p.c.	3½ oz.	4.00
Hyoscyamus-leaf ...	1897 = 70 p.c.	4 oz.	0.30
Ditto ...	1902 = 50 p.c.	6½ oz.	0.25
Stramonium-leaf ...	1897 = 70 p.c.	2 oz.	1.54
Stramonium-seed ...	1897 = 70 p.c.	not taken	2.73

* Hydrochlorides.

A number of observations have been made on the keeping properties, &c., of the extracts, but as further work is in progress these are for the present withheld. The author thinks the time has arrived when the question of the introduction of some extracts of this class into the Imperial Pharmacopœia will have to be faced, and in connection therewith an attempt should be made to work out a scheme for the standardisation of those which admit of such a form of treatment.

Some of the necessary work in connection with a project of this description has already been done, and many of the facts and figures needed are available, but much more will have to be done before any official treatment of the subject on a systematic basis can be attempted.

One of the most difficult questions to be settled is the standards, and with a view to eliciting information, and opening out a discussion upon the subject, the attention of the members was drawn to two lists of standards for alcoholic extracts, the first by C. H. La Wall and the second by a well-known firm of manufacturers, as follows:—

Extract	Percentage of Alkaloid	
	La Wall	Manufacturers
Aconite-root ...	2.50	Test, physiological
Belladonna-leaf ...	2.00	1.75
Conium-fruit ...	1.75	2.50
Colchicum-root ...	2.00	2.50
Colchicum-seed ...	None	2.50
Hyoscyamus-leaf ...	0.90	0.50
Stramonium-leaf ...	None	1.50
Stramonium-seed ...	1.75	1.50

Comparing the above standards with the figures shown in the first table, it will be seen that, with one or two exceptions, they appear to be reasonable and practicable, but in one or two cases they will need modification for extracts made from English-grown drugs. Conium is a case in point, where a 5-per-cent. standard for alkaloids would be quite practicable. The most difficult case is that of hyoscyamus. La Wall's standard of 0.9 per cent. is much too high for a preparation of the British plant, and even 0.5 per cent. will be found too high.

The other papers on "The Volumetric Determination of Sodium Phosphate and Arsenate," by Messrs. F. R. Dunderidge and J. S. Hill, and "The Volumetric Estimation of Lead Salts," by Messrs. R. C. Cowley and J. P. Catford, we hope to give next week.

PRESENTATION TO MR. NAYLOR.

The PRESIDENT said: You all know what the duties of a Secretary of a Conference like this are—the enormous work that has to be done, unobtrusively and sometimes against the grain. We have been blessed in our Secretaries. Dr. Attfield was a man who did a lot for the Conference. He made the expression "pharmaceutical chemist" possible, and made the Conference the success it has been. He was followed by a very excellent man; and we have one, who is with us now, whom we all admire for the amount of energy which he threw into the work. I allude to Mr. Naylor. (Applause.) When he retired during my presidency I considered that the Conference had received a blow which it was scarcely possible to estimate. He left carrying with him the hearty good wishes of every member of the Conference. (Applause.) We have ventured to ask members of the Conference to show, in a small degree, how they felt the value of his services, and a large number of responsible men have sent in subscriptions. We limited the amount, not wishing to make it a tax on anybody. If we had left it an open question the amount subscribed would have been very much larger. No fewer than 230 members and friends have subscribed to the testimonial which it is my honour and pleasure to put into his hands. We have had accompanying these subscriptions hundreds of letters conveying the good wishes of the donors. I hold in my hand an illuminated



MR. W. A. H. NAYLOR.

address, not in gorgeous colours—we were afraid to hurt his feelings—(laughter)—but in plain black and white, with a little illumination, containing the signatures of those donors, and these, I am sure, he will treasure as long as he lives. In addition to the address we are going to present him with a writing-desk and with four water-colours, selected by himself. In after-years these will be a continuous source of pleasure, and I am sure they will afford him reminiscences of many happy hours experienced during the fifteen years he served as Secretary, and will be mementos of many friends whom he has met in various parts of Great Britain. The President concluded by asking Mr. Naylor to accept those tokens of good will presented by so many sincere friends. (Applause.)

Mr. ATKINS said: It is a great pleasure for me to be allowed to take part in conferring this graceful and fitting compliment. I heartily congratulate Mr. Naylor on the fact that so large a gathering and so large a number of ladies are here. When I first heard that Mr. Naylor was obliged to retire I had an idea that we had better close the Conference. (Laughter.) That, of course, was a mistaken impression, because there are excellent secretaries existing, but I do

wish to express my deep debt of gratitude to Mr. Naylor, and my great admiration for his character. When I say that I believe it would be possible for Mr. Naylor to take rough, raw, and unfitting material and mould it into a permanent official, leading him through his term of office as President, I offer myself as a living example of his wonderful power. (Laughter and applause.) He has first of all an intimate, accurate, and sound acquaintance with the science with which we deal. He also has a knowledge of human nature, and he knows how to deal with us angular beings who require to be treated with great consideration. (Laughter.) To use a hackneyed phrase, he knows how to combine the *suaviter in modo* with the *fortiter in re*, and sometimes the *fortiter in re* was wisely shown and administered, and I think we were all the happier and the better for it. The *Year-book* will long enshrine the work which Mr. Naylor accomplished, and it will be an abiding record of his great power and character. It is well that he should have in his home, in his family life, some indication of the esteem in which we hold him. I am glad the response to this testimonial has been so widely met, and that you have handed to him the record and the other portions of our gift, and doubly glad to think that in his home life there will always be afforded evidence of our great esteem. (Loud applause.)

Mr. MARTIN also spoke of the services of Mr. Naylor, and referred to the debt members were under to the joint Secretaries of the Conference. He was sure none of them would grudge the senior Secretary a holiday even if the issue of the *Year-book* was delayed a week or two. (Applause.)

Mr. NAYLOR, who was very cordially received on rising to reply, said: Mr. President, ladies and gentlemen, and members of the British Pharmaceutical Conference.—By your magnificent gift to-day, I feel that you have placed me under a debt of obligation which I can never repay. The all too flattering comments and kindly sentiments with which you have accompanied this gift have added immensely to my embarrassment in acknowledging it. When I reflect that this most generous tribute to the comparatively small service which I have rendered the Conference comes—shall I say?—as the crowning act of a long series of indulgences and kindnesses manifold, my heart is stirred to its utmost depths. Oppressed as I am by the consciousness of my utter inability at this moment to express the gratitude I feel, I can only find relief in the simplest and homeliest language. Will you please, one and all who have subscribed so liberally to this testimonial, accept my sincere and heartfelt thanks for your valuable gift, and not less for the never-to-be-forgotten good wishes with which you have accompanied it? (Applause.) I am also grateful to you for having afforded me an opportunity of selecting the articles for personal use and domestic adornment, and I am sure you will be gratified to know that they are according to the taste and the need of my wife and myself—(applause)—and that we are more than satisfied with the selections that we have made. I do not know whether you will pardon one personal remark—that while the paintings will give grace and charm to the home they will be to my wife especially, and by reason of her disability as cut off from the world of sound, in a large measure a compensating and lasting pleasure. (Applause.) And now, as a farewell word ere I retire from official life into the ranks, I should like to say what a great advantage it has been to me to have been officially connected for so considerable a time with the Conference. It has opened up to me a field of usefulness and opportunity which many a young man more gifted than myself would have gladly embraced. Experience of the duties of the Secretaryship in happy and long association with my friend Mr. Ransom has been an education to me of a kind that will prove of life-long service. It has also brought to me the inestimable privilege of intimate association with men of light and leading in our ranks, and into fuller fellowship with the members of the British Pharmaceutical Conference who are accustomed to foregather at these annual meetings. And now I am afraid I have overlooked what has been put in my hands, but I can assure you I shall very highly prize this beautifully illustrated album with the *facsimile* signatures of the subscribers. I have just one word of regret. It is this—that the gifts could not have very well been brought to this distance, and so they cannot be on exhibition, but I assure you

if it is a matter of convenience when any of you are in London, it would give my wife and myself very great pleasure to show them should you kindly favour us with a visit. (Applause.)

NEXT YEAR'S MEETING.

The PRESIDENT said he believed there was a gentleman in the room who knew better than he did where next year's meeting was to be. Perhaps he would speak.

Mr. J. W. WHITE (Clifton), on behalf of the pharmacists of Bristol and Clifton, invited the members of the Conference to Bristol next year. It was about thirty years since the Conference visited Bristol, and during that long interval its natural beauties had not diminished. In one respect they would be somewhat at a loss. Some of their older and more illustrious brethren had passed away. There would be no Schacht, or Stoddart, or Giles to extend the right hand of fellowship and shed a local lustre on their deliberations, but the existing members would do their best to give the Conference a hearty welcome.

Mr. E. F. YOUNG (Bristol) cordially supported Mr. White's invitation. He thought they would find in Bristol much of great interest. Members would be able to spend a most delightful holiday. Bristol, he judged, had suffered in the past from undue modesty. An opinion appeared to be prevalent that Bristol was existing in the light of a historic past. (Laughter.) It had been suggested to him the other day that "Bristol had had its day." Perhaps it had not increased at the phenomenal rate of other more mushroom towns. (Laughter.) Since the first dock was cut in Bristol in 1267 the town had shown a steady increase—(laughter)—and in 1903 the Conference would doubtless find they had made very considerable progress in modernity. It had been reported that certain pessimistic Scotch prophets had predicted that the Conference was to be buried in Dundee. All he (the speaker) could say was that the funeral has been a very enjoyable one—(great laughter and applause)—and he trusted that next year the resurrection would be as pleasant. (Laughter and applause.)

Mr. TURNER (Bristol) also added his word to that of previous speakers. He reminded the meeting, amid much laughter, that the distance between Bristol and Dundee was the same as that between Dundee and Bristol. He trusted that those advanced educationists of Scotland, from whom they had heard so much that day, would come and illumine some of the dark places of Bristol. (Laughter.) He could assure them a hearty reception.

Mr. H. E. BOORNE also dilated on the beauties and wonders of Bristol and district, and assured the meeting of a cordial welcome.

Mr. WELLS said he rose with very great pleasure to propose that the meeting cordially accept the invitation to Bristol. He thought it would be most appropriate that as they met in Ireland last year, and in Scotland on this occasion, where they had received such a hearty welcome, that they should meet next year in England. Of course it was well known, even in ancient days, that Scotland always gave a warm welcome to invaders, even if it was with cold steel. (Laughter.) They had heard so many things of Bristol that he felt sure if they accepted the invitation, they would get a hearty reception there. Some few years ago it had been prophesied that the Conference was going to collapse. After the Conferences of Dublin and Dundee they need have no fear of that, and those who prophesied collapse, ought to have waited until they knew. (Applause.)

Mr. JAMES RUSSELL (Dundee) seconded the motion. If they went to Bristol, he said, it would help to keep up the reputation of the Conference to show that they had been well treated in Dundee, and that they expected also to have similar treatment in Bristol.

The PRESIDENT, in putting the motion to the meeting, said Bristol was known to everybody as being the home of two or three of their most illustrious pharmacists. It was the city in England that he liked best after his own, and he knew that the hospitality they would receive, combined with the charms of the beautiful scenery around it would greatly contribute to the success of the Conference.

The motion was unanimously and very heartily agreed to.

SHEFFIELD FOR 1904.

Mr. NEWSHOLME asked permission to give a hint that after the Conference in Bristol Sheffield would like to be honoured by a visit from the Conference. He hoped to be present next year, when he would speak of the glowing beauties of Sheffield. (Laughter.) It was said to be smoky, but the same had been said of Dundee, and they had not found it so—(hear, hear)—and they would find Sheffield not so black as it was painted. Someone had spoken of it as "hell with heaven drawing its arms around it"—(laughter)—and while it was not deserving of the first description, certainly there was an extremely charming country round about it. (Applause.)

BELL AND HILLS FUND.

The PRESIDENT then presented nine volumes of books to the Forfarshire and District Chemists' Association, the annual donation from this fund. The gift was accepted, on behalf of the Association, by Mr. WM. CUMMINGS, in a terse speech.

The books were: Squire's "London Hospitals Pharmacopœias," "Companion to the B.P.," Strassburger's "Practical Botany," Greenish's "Materia Medica," White and Humphrey's "Pharmacopœia," Caspari's "Pharmacy," Quain's "Dictionary of Medicine," "United States Dispensatory." Tuson's "Veterinary Pharmacopœia."

FORMULARY COMMITTEE.

Mr. S. R. ATKINS proposed that Messrs. N. H. Martin, W. A. H. Naylor, F. C. J. Bird, Peter Boa, F. Ransom, W. F. Wells, J. C. Umney, Harold Wilson, R. Wright, and Harry Wilson be appointed the Formulary Committee. He alluded to the fact that Mr. J. C. Umney was appointed to fill the place rendered vacant by the death of that estimable pharmacist, Mr. William Martindale, and he added a few graceful encomiums on his departed friend.

The proposition was seconded by Mr. THEO. H. WARDLEWORTH, who pointed out the importance of the work done by the Committee, and the fact that, of the 2,000 copies of the last B.P.C. Formulary, 1,500 copies had already been sold.

The proposition was unanimously adopted, subject to the consent of Messrs. Harold Wilson, R. Wright, and Harry Wilson, who were absent.

MORE VICE-PRESIDENTS.

The PRESIDENT moved that the words "four vice-presidents" in Rule V. should be altered to "a number of Vice-Presidents not exceeding six." There were obvious reasons for this, and the Executive Committee recommended the alteration.

Mr. UMNEY formally seconded, and the alteration was approved.

OFFICERS FOR 1902-3.

The PRESIDENT, in moving the election of offices for 1902-3, took occasion to refer particularly to his proposed successor in the chair. The committee had selected for their approval a name which he thought would commend itself to the Conference. Whatever the gentleman whom he would name touched had turned to gold; in connection with pharmacy he had written a book on "Essential Oils" which had enhanced his reputation in that respect; and he (Mr. Druce) was sure he would bring to bear on the Conference proceedings all the business knowledge and capability of which he was the possessor. He was sure they would have pleasure in approving of the nomination of Mr. Idris (London) as the next President of the Conference. (Loud applause.)

The resolution was agreed to cordially, and the officers were, on the motion of the Chairman, elected as follows:—

President—T. H. W. Idris, J.P., L.C.C., F.C.S.

Vice-Presidents—G. T. W. Newsholme, F.C.S., G. D. Beggs, Peter Boa, J. W. White, and W. A. H. Naylor.

Treasurer—J. C. Umney.

Hon. Secretaries—F. Ransom and E. S. Peck.

Executive Committee—L. Atkinson, E. H. Farr, F. C. J. Bird, W. Cummings, H. E. Matthews, Professor Greenish, E. White, T. Tyrer, and G. T. Turner.

Hon. Local Secretary—H. P. Boorne.

Auditors—J. W. Bowen and W. P. Robinson.

Assistant Secretary—J. Hearn.

Mr. IDRIS, who was received with acclamation, said he thanked them very heartily for the proposition and vote they had just carried, by which they put him in the high and honourable position of President of the Conference. It was a post he never in his wildest dreams hoped to attain to, and he did not know the particular reasons why he had been selected. He, however, would do his best to justify their selection, and hoped they would have a very successful and happy gathering in Bristol next year. (Applause.)

VOTES OF THANKS.

Mr. NEWSHOLME moved a hearty vote of thanks to the Local Committee, including Mr. Charles Kerr (Chairman), Mr. A. B. Anderson (Vice-Chairman), Mr. W. Cummings (Secretary), Mr. J. M. Hardie (Treasurer), and Mr. Russell (Chairman of the Ladies' Committee), for the excellence of the arrangements they had made for carrying out the business of the meetings. (Applause.) Mr. Newsholme spoke in complimentary terms of each of the gentlemen, emphasising specially the work which Mr. Kerr had done. Mr. Kerr, he said, had been known for a great many years as a prominent pharmacist in Scotland and throughout the whole country. Mr. Newsholme also suitably acknowledged the services of Mr. Hardie and the other members.

Mr. UMNEY, in a few happy remarks seconded, and

The PRESIDENT added some observations regarding the success of the Conference in Dundee.

Mr. KERR returned thanks for the compliment. There had certainly, he said, been a great deal of work, but it had been done with a great deal of pleasure, and everyone had tried to bring it to a successful issue. The Hon. Secretary certainly deserved all praise for his labours.

Mr. A. B. ANDERSON, Mr. W. CUMMINGS, and Mr. J. M. HARDIE replied in a sentence, and Mr. JAMES RUSSELL said it had been a great pleasure to them to have had the ladies from England and Ireland as well as those from Scotland, and the Ladies' Committee had co-operated very heartily with him in all that had been done for their entertainment.

Mr. J. C. C. PAYNE moved a cordial vote of thanks to the Lord Provost and Mrs. Hunter for the brilliant reception they gave the Conference in the Victoria Art Galleries on Monday. He spoke of the proceedings on that occasion as having been most agreeable in every respect. They used to hold their Conferences without civic recognition in some hall, where they quietly transacted their business and went away again. They were now being publicly received, and ladies came to the Conference. (Applause.)

Mr. PETER BOA formally seconded, and the PRESIDENT, in putting the motion, also took occasion to express his appreciation of the action of the Lord Provost as head of the municipality.

The motion was carried unanimously.

Mr. TYRER moved a vote of thanks to the Principal of the College and to the Professor of Chemistry for the use of the rooms in the college for the purpose of the Conference. Mr. TURNER seconded, and the motion was cordially passed.

Mr. MARTIN moved that the Conference place on record its appreciation of and thanks for the efficient and inspiring way in which the President (Mr. Druce) had conducted the business of the meeting during his presidency, and the vote was seconded by Mr. IDRIS (newly elected President).

Mr. ATKINS associated himself with what had been said by Mr. Martin and Mr. Idris, and said Mr. Druce's kindness, courtesy, fairness, and knowledge of the questions treated would live long in the memory of all who had been present. (Applause.)

The motion was passed with enthusiasm, a call of three cheers for Mr. Druce being vigorously responded to, and also "one more for the Mrs. Druce to be." (Laughter and cheers.)

The PRESIDENT, in acknowledging the great kindness which had been shown him, said he had taken upon himself the duties of the Conference with great hesitation, because he knew how much the position demanded; and he felt that with only a certain limited knowledge of a certain subject it would be almost impossible to bring it before the Conference with any degree of pleasure. For the kindness with which they had received him at Dublin last year, and still more on this occasion, he could only say, "Thank you, from the bottom of my heart." (Applause.)

Legal Reports.

High Court Cases.

KODAK (LIMITED) v. DUBLITT.

In the Chancery Division of the High Court of Justice on August 7, Mr. Kearly, on behalf of Kodak (Limited), stated that this was a motion similar to other motions that had been made by Kodak (Limited). Having regard to what had taken place in the other actions, he did not think he could bring on the motion. Subject to the sanction of the Court, he had agreed with Mr. Clayton, who appeared on the other side, that there should be no order on the motion except that the costs should be costs in the action. His Lordship agreed.

BEECHAM v. SCHOLEFIELD.

In the Chancery Division of the High Court of Justice on August 8, this case came before Mr. Justice Joyce on a motion for judgment in default of defence. Mr. Martelli appeared for the plaintiff, and stated that the action was brought to restrain the defendant (trading as the Public Drug Company, of Liverpool) from selling as Beecham's pills pills not manufactured by the plaintiff. The defendant had been in the habit of selling pills not manufactured by the plaintiff when asked for Beecham's. An interim injunction until the trial had been already granted (*C. & D.*, May 31, page 860). The defendant did not now appear, and Mr. Justice Joyce granted a perpetual injunction, with an inquiry as to damages.

CHEMICAL-WORKS NUISANCE.

MR. JUSTICE SWINFEN EADY, in the Chancery Division on August 7 and 8, had before him an action by Mrs. Craven, of Warr Common Farm, Liversedge, Yorks, against the Hightown Chemical Company for an injunction to restrain them from carrying on their business in such a way as to cause a nuisance and damage the plaintiff's property. The defendants manufactured picric acid, and noisome fumes, it was stated, were given off from their chimneys, and a hot yellowish refuse was discharged through a ditch which ran past plaintiff's house, and destroyed vegetation. The water in a well had also been affected and rendered unfit for use. The plaintiff's evidence having been heard, a settlement was effected, the defendants agreeing to purchase the property.

The Customs Act.

SACCHARINE CASES.

AT the Mansion House Police Court on August 13, Karl Fredk. Kramer, drug-merehant, carrying on business at 11 Rangoon Street, Crutched Friars, E.C., was charged on a warrant, before Sir David Evans, with harbouring and having in his possession, duty not having been paid on the same, 740 lbs. weight of saccharine, contrary to the Customs Act. Mr. S. Myers, solicitor, defended. Mr. Alfred Wm. Sarkey, confidential officer of Customs, said that on August 12, having reason to suspect that the accused had in his possession a quantity of saccharine upon which duty had not been paid, visited two rooms on the first floor at 11 Rangoon Street, Crutchedfriars. He saw the prisoner, and informed him of the object of his visit. The accused said, "It is not necessary for me to say anything," and sat down in a chair. The witness said, "I have a warrant to search your premises," and pointing to some packages beneath the table, asked, "What have you there?" The accused said, "I suppose it is what you are seeking." The witness asked, "Has duty been paid upon it?" to which the prisoner replied, "I have paid no duty." With the assistance of Detective-Inspector Murphy, of the Old Jewry, witness searched the premises, and found fifty-six packages ready for delivery, each containing 3 lbs. weight of saccharine, and two cases, each containing six large packages, with 10 lbs. of saccharine—740 lbs. in all. He asked the accused whether he had any record of the goods. The prisoner said, "I keep no books relating to these transactions, and all letters I have received relating to it I have destroyed." He informed the prisoner that two men in his employ had been stopped in Southwark on their leaving premises on which a large quantity of

saccharine had been found. The prisoner answered, "The premises were under my control, and I take all responsibility." The witness said that the matter was a very serious one, and the prisoner must consider himself under detention. The single value and duty on the saccharine found at 11 Rangoon Street was 1,800/., whilst the penalty was treble duty. By Mr. Myers: He could not say anything about the business carried on by the prisoner beyond the fact that he had been at that address some twelve months. Inspector Murphy gave corroborative evidence. He believed the accused was carrying on a perfectly *bona-fide* business as a drug-merehant. Sir David Evans adjourned the case on the application of the solicitor for the defence, admitting the accused to bail—two sureties in 250/., or one in 500/.

Edwin Brooke (62), warehouseman, 18 Coppermill Lane, Walthamstow, and his son, Edwin Henry Brooke (24), warehouseman, 25 Borwick Avenue, Forest Road, Walthamstow, were charged before Mr. Cecil M. Chapman, at Southwark Police Court, on August 13, with being concerned together in carrying and having in their possession 30 lbs. of saccharine, of the single value and duty amounting to 75/., contrary to the Customs laws. They were further charged with otherwise dealing with about 90 lbs. of saccharine at 7 Aberdour Street, Bermondsey.

Mr. A. W. Starkey, a confidential officer of the Solicitors' Department of his Majesty's Customs, said a trade appeared to have sprung up for the importation of masked and disguised saccharine, and after evading duty the disguise was removed by a process of heating and drying, which would probably be explained to the Court at the next hearing. On Tuesday afternoon he saw the prisoners leave No. 7 Aberdour Street, known as the "Clyde Works," carrying the three parcels now produced. He asked the prisoners what they had in the parcels, and they said they did not know, except that it was "preservative-powder," which they were going to take to the City. Each parcel contained five 2-lb. tins of saccharine. An examination of the premises disclosed 90 lbs. of saccharine in various stages of preparation. There was a drying-room, with a furnace and a number of trays with saccharine upon them, and drums containing masked saccharine, as imported. The prisoners, who said they were employed by Mr. Kramer, of 11 Rangoon Street, Crutchedfriars, were remanded. Bail was fixed at 100/ each, with notice to the police.

Dentists Act.

AT Bow Street Police Court on August 13, before Mr. Marsham, John Panhams, 60 Gower Street, W.C., was summoned for using the description of "dentist" without being registered under the Dentists Act.

Mr. Turner appeared in support of the summons on behalf of the British Dental Association, and Mr. Arthur Newton defended.

Mr. Turner said the defendant was practising as a dentist at the address given, and the name-plate outside bore the words, "John Panhams, dentist." The defendant not being registered, Mr. Brown, managing clerk to the solicitors to the Dental Association, called upon him. Defendant said he had been in the Tottenham Court Road for some time, and thought he was entitled to use the word "dentist." He was told that this was a mistake, and subsequently Messrs. Newton, his solicitors, wrote stating that defendant was properly qualified in Austria-Hungary, his native country, and that he was taking the necessary steps to be registered in England. In December last the defendant made an application to be registered, and it was not acceded to. Further than that he now placed on his door-plate the German equivalent of "mechanical dentist."

Mr. Newton, in addressing the Magistrate, said the case was an exceptional one, and he had hoped that the Association would not have thought it necessary to take out a summons. There could be no question that the defendant was a man of the highest character in every sense of the word, and this was not a case of an ignorant and unskilful man acting as a dentist. In 1895 the defendant obtained in Austria-Hungary a certificate that he was a person entitled to act as a dental practitioner, and he was a person contemplated under Section 9 of the statute, which said that where a person not a British subject was properly qualified he was

entitled to be registered as a dentist under Section 10. He (Mr. Newton) submitted that the defendant had made a genuine mistake.

Mr. Panhams then went into the witness-box, and bore out this statement. In reply to Mr. Turner, he said he studied for six years before he got his certificate, but he was never in any hospital.

Mr. Turner: Who examined you at the end of the six years?—Witness: The police. (Much laughter.)

Re-examined, witness said that during three of the six years he was with a properly qualified medical man.

Mr. Turner pointed out that to be registered in Austria a man was not required to go through a hospital curriculum. He was pretty sure that the General Medical Council would refuse to register a man under those circumstances.

Mr. Newton: That is an amazing statement to make.

Mr. Marsham: It is nothing to do with me; it is a matter for the British Medical Council. I fine the defendant 5*l.*, and he must pay 3*l.* 3*s.* costs.

Lease Liabilities.

DR. JOHN ATTFIELD, Ashlands, Watford, Hertfordshire, proprietor of two grocers' shops at Torrington Parade, North Finchley, brought an action at the Clerkenwell County Court last week against Mr. George Newby, a former occupier, to recover 69*l.* 5*s.* for dilapidations. Defendant took the premises under a twenty-one years' lease in March, 1888, and in September, 1900, he wrote to Dr. Attfield saying that as his health was bad he would like to know upon what terms a new lease would be granted, as he was endeavouring to find a purchaser for the business. A new lease was drawn up, but before it was executed defendant transferred the business to Messrs. Honey & Reynolds, who have paid the rent since 1900. Defendant repudiated his liability for the repairs, urging that as plaintiff had accepted new tenants at an increased rental his liability was at an end. A verdict was given for the plaintiff, the Judge holding there had been a breach of covenant. Messrs. Honey & Reynolds were brought into the action as third parties, and Mr. Newby afterwards obtained a verdict against them for the amount claimed by Dr. Attfield.

A Bill-posting Account.

At the Salford Hundred Court of Record on August 8, before Mr. H. G. Shee, K.C. (Judge), and a jury, an action was brought by Messrs. Chapple & Co., bill-posters, Manchester, to recover 15*l.* 15*s.* for posting bills setting forth the advantages of "Veno's Lightning Cough-cure." The case occupied the Court several hours. According to the plaintiffs' witnesses, Mr. Veno, in October last, gave an order to the firm to post bills on their hoardings at 16*s.* 8*d.* per 100 sheets, "double-crown," for four months, less a discount of 10 per cent. Hoardings were selected and the work done, but when payment was demanded Mr. Veno referred the plaintiff to Mr. Sims, his advertising-agent. Mr. Sims had, during the term, become bankrupt, but in his statement of affairs the plaintiffs were credited with the amount due on Veno's contract, less 15 per cent. The plaintiffs admitted having agreed to allow Sims 5 per cent. on the transaction, because they expected other work through Sims, and he had felt aggrieved that the plaintiffs should have gone to Mr. Veno direct, but that did not absolve the defendant from his contract. Mr. Veno said he had done his business through Sims, and paid him the money. This Mr. Sims admitted. After the legal arguments the jury found for the plaintiff for the full amount claimed, with costs.

Sale of Food and Drugs Acts.

SALICYLATED ORANGE-WINE.

At Melksham Police Court on August 7, William Beale, grocer, Bank Street, Melksham, was summoned for selling orange-wine which contained 0.18 per cent. of salicylic acid.

On behalf of the County Council, who prosecuted, Mr. T. W. Crutwill said that salicylic acid was extracted from carbolic acid, and was used as a preservative. It was, however, decidedly injurious to health, and a recent Royal Commission had recommended that only 1 gr. of the acid per

pint of liquid, or per lb. of solid, food should be allowed to be used, and that the vendor of the article should state that it contained salicylic acid. In the present case there were 15 grs. of the acid to 1 pint of wine.

Defendant, who pleaded that he sold the wine in the same state as it was received from the wholesale firm, Messrs. Paterson & Sons, Glasgow, was fined 5*l.* and costs, the latter to include 2*l.* 2*s.* solicitor's fee.

County Court Case.

AN ELECTRIC-LIGHT INSTALLATION.

At the sitting of the Greenwich County Court on August 1, Judge Addison, K.C., had before him a case in which Mr. T. M. Davis, chemist and druggist, of 241 Lewisham High Road, was sued by the National Electric-wiring Company for 25*l.* 15*s.*, damages for wrongful conversion of an electric-light installation fitted by the plaintiffs in the premises occupied by the defendant.

The evidence showed that the plaintiff company agreed to fit up electric installations in premises, receiving in return a rent of so much per unit of current used, with a minimum charge per lamp, the customer having the right to purchase after a stated period. An installation was put in at 241 Lewisham High Road, with stipulations as to making the usual agreement with the next tenant. Defendant's predecessor, owing rent, left behind certain fixtures, and the owner of the premises, being ignorant of the agreement with the plaintiffs, or even of the fact that the electric light was installed on the premises, agreed with the defendant to put in a new shop-front, Mr. Davis to receive in consideration 25*l.* and the fixtures left behind by the previous tenant. On entering into occupation in June, 1899, Mr. Davis was informed that the installation was the property of the plaintiffs, and of the terms upon which he could use it. Defendant refused to sign an agreement, and claimed the installation as his property. He, however, intimated that if it belonged to the plaintiffs they could take it away, as he had an estimate for an installation for 6*l.* Plaintiffs continued to supply the current, and hearing nothing further about the matter defendant concluded that the plaintiffs had dropped their claim.

Judgment was entered for the defendant.

Bankruptcy Report.

Re LAURA VERRALL CROSSLEY (trading as Blanche Leigh), 126 Oxford Street, W., and Paris, Soap and Perfumery Manufacturer and Vendor.—The adjourned public examination of this debtor was taken on June 6, at the London Bankruptcy Court, before Mr. Registrar Giffard. Debtor, who presented her own petition in May, started manufacturing soap and perfumes in Paris five years ago. A small branch depot was opened in London at Brook Street, and eighteen months afterwards the Oxford Street premises were taken. The Paris liabilities were returned at 30,000*l.*, and the assets were 25,000*l.*, exclusive of goodwill, worth about 10,000*l.* The English liabilities were returned at 22,270*l.*, some of which may not rank, and assets 3,500*l.* The want of capital some eighteen months ago induced debtor to endeavour to form the businesses into a company, with a capital of 200,000*l.*, it being understood that the promoters would provide 40,000*l.* working-capital on conditions. Certain creditors refusing to come in, the arrangement fell through. An incomplete statement of affairs has been put in, showing English unsecured creditors 8,325*l.*, and French unsecured creditors 5,043*l.*; no fully secured or contingent liabilities appear in the statement. The failure is attributed to want of capital. On the case being called, a medical certificate was produced to the effect that the debtor was suffering from illness. The examination was therefore adjourned to October 29. The following list of creditors was furnished:—

	£	s.	d.
Ballin, A., Agar Street, W.C. ...	39	15	0
Beeton & Co. (Limited), Fetter Lane, E.C.	30	1	0
Bemrose & Sons, Old Bailey, E.C. ...	103	3	0
Burgoyne, Burbidges & Co., Coleman Street, E.C. ...	22	18	9
Cohen, Philip, & Co., Holborn Place, E.C.	24	19	0
Crossley, Herbert, 15 Cork Street, W. ...	855	17	11
Curwen & Son, Berners Street, W. ...	94	7	6
De Wynter, Chrisp & Co., Charing Cross Road, W.C. ...	556	10	0

	£	s.	d.
Elsner Drukery, Amsterdam ...	51	0	0
Goode, M. & H., South Audley Street, W.	163	11	5
Hill, W., & Co., Southampton Row, W.C.	167	4	0
Houchin, J., Bridport Place, N.	245	5	6
Johnsen & Jørgensen, Bury Court, E.C.	12	12	0
McCaw & Co., Belfast ...	14	11	2
Mather & Crowther, New Bridge Street, E.C.	454	8	10
Osborne, Garrett & Co., Frith Street, W.C.	11	15	6
Parke's Drug Stores, Camden Town, N.W.	61	1	0
Squire, Henry, & Co., King William Street, E.C.	221	0	0
Touwer, W., Brighton ...	25	6	0
Walker & Co., Chancery Lane, W.	240	18	1
Willett, Mrs., Powis Square, W.	4,700	0	0

A supplemental list of French creditors, totalling 126,083f., has also been filed.

Deed of Arrangement.

Lamb, Charles, trading as "Charles Lamb & Co.," 61 Mark Lane, London, E.C., and Manor Lodge, Beacon Road, Lewisham, chemical manufacturer and agent. Trustee, John P. W. Goodwin, 31 Copthall Avenue, E.C., accountant. Dated, August 2; filed, August 8. Liabilities unsecured, 2,946l. 17s.; secured creditors, 100l.; estimated net assets, 639l. 11s. 6d. The following are scheduled as creditors:—

	£	s.	d.
Adams, G., London...	400	0	0
Berk, F. W., & Co., London ...	24	0	0
Bold, Raus & Allan, Liverpool ...	10	0	0
Bryce & Rumpff, London ...	204	0	0
Caudery, W., & Son, London ...	110	0	0
Child Clay Company, Manchester City and London Real-property Company, London ...	37	0	0
Credit Assurance Company, London ...	21	0	0
Crosfield, J., & Sons, Warrington ...	125	0	0
Eck, —, London ...	38	0	0
Forster & Gregory, London ...	688	0	0
Gates, H. S., London ...	26	0	0
Greeff, R. W., & Co., London ...	12	0	0
Grimshaw Brothers, Manchester...	42	0	0
Haddock, Parker & Co., Liverpool ...	14	0	0
Hemingway & Co., London ...	45	0	0
Johnseu, C., Christiansand ...	20	0	0
King, D. (exors. of), London ...	91	0	0
King, T., London ...	35	0	0
Lindsey, C. R., & Co., Manchester ...	28	0	0
Luke & Bailey, London ...	147	0	0
Lyon, J. L., & Co., London ...	15	0	0
Mangold, C., & Co., London ...	13	0	0
Mayer, E. E., & Co., London ...	62	0	0
Petri Brothers, London ...	50	0	0
Sbeehan, P., & Sons, London ...	269	0	0
Stokes, J., Margate...	12	0	0
Sumpter, H., Eastbourne...	10	0	0
Townsend, —, London ...	38	0	0
Typke & King, London ...	15	0	0
United Alkali Company, Liverpool ...			
Vale of Belvoir Plaster Company, Newark-on-Trent ...			
Vereinigte Chemische Fabriken, Stassfurt ...			
Wallace, H., & Co., London ...			

Gazette.

Partnerships Dissolved.

Brunot, P., and Grohmann, O. W. B., under the style of Brunot & Grohmann, Wetherby Terrace, Earl's Court, W., perfumers.

Forbes, R. T., and White, S. H., under the style of Forbes & White, Sandiacre, Derbyshire, physicians and surgeons.

The Bankruptcy Acts, 1883 and 1890.

ADJUDICATION.

Tizard, Henry John, Colney Hatch Asylum, New Southgate, Middlesex, assistant medical superintendent.

New Companies.

PORTSMOUTH LICENSED VICTUALLERS' MINERAL-WATER SYNDICATE (LIMITED).—Capital 1,000l., in 1l. shares. Objects: To carry on the business of manufacturers and vendors of mineral waters and non-alcoholic drinks, &c. Registered office, 42a Green Road, Southsea.

HENDERSON BROTHERS (LIMITED).—Chartered in Vancouver, British Columbia, with a capital of \$400,000. To consolidate the McDowell, Atkins, Watson Co., and Henderson Brothers, of Vancouver, and to carry on a business as wholesale and retail druggists and chemists.

CLAYTON BOTTLING COMPANY (LIMITED).—Capital 2,000l., in 1l. shares. Objects: To acquire the business carried on at Castle Street, Bevois Town, Southampton, as "The Clayton Bottling Company," to adopt an agreement with B. G. Gruntwag and T. H. Perkins, and to carry on the business of mineral-water and cordial manufacturers and bottlers, &c. Registered office, 26 Budge Row, Cannon Street, E.C.

WILSON & COVENTRY (LIMITED).—Capital 10,000l., in 1l. shares (5,000 preference). Objects: To carry on in England, the Canary Islands, or elsewhere the business of general merchants, importers and exporters of merchandise and produce, chemical manufacturers and dealers, drysalters, jute and hemp merchants, &c. The first directors (to number not less than two nor more than five) are to be appointed by the subscribers. Qualification, 100l. Remuneration, as fixed by the company. Registered office, 21 Dale Street, Liverpool.

C. M. HARRIS (LIMITED).—Capital 1,000l., in 1l. shares. Objects: To take over the business of a patent medicine vendor, drug merchant, and general store-keeper, now carried on at Fore Street, Camelford, Cornwall. The first subscribers are: C. M. Harris, Camelford, merchant; H. Harris, Cambridge University, medical student; Mrs. L. M. V. Harris, Fore Street, Camelford; N. Harris, J.P., Trewannion, Cornwall; A. V. Harris, Helsett, Trewannion, Cornwall, farmer; J. B. Harris, Trewannion, farmer; Mrs. C. H. Harris, Trewannion, Cornwall; Miss A. M. Harris, Kelsett, Trewannion, Cornwall; and Miss J. L. Harris, Trewannion, Cornwall. No initial public issue. C. M. Harris is permanent managing director.

JOHN KNIGHT & SONS (LIMITED).—Capital 310,000l., in 10l. shares. Objects: To acquire the business of soap-makers, &c., carried on at Silvertown Soap-works and Oil Mills, Victoria Docks, West Ham, Essex, at Islington, N., and at Deptford, S.E., as "John Knight & Sons," and to carry on the business of soap-makers and perfumers, tallow-melters and refiners, glycerine-distillers and refiners, bone-boilers, charcoal-makers, oil refiners, candle-makers, manure manufacturers, makers of edible fats and tallow, &c. No initial public issue. The first directors are A. Knight, W. D. Knight, J. B. Knight, W. E. D. Knight (managing director), A. H. K. Knight-Squire, and E. Knight, jun. Remuneration of W. D. Knight and J. B. Knight 1,000l. each per annum; of managing director, as fixed by agreement; of other directors, 200l. each per annum. Registered office, Silvertown, West Ham, Essex.

RANDALL & SON (LIMITED).—Capital 12,000l., in 1l. shares (7,500 preference). Objects: To acquire the business of wholesale and retail druggists, manufacturing pharmaceutical chemists, drug-merchants, manufacturers of methylated spirit, &c., carried on by W. B. Randall and H. Wilson at 146 High Street, Southampton, as "Randall & Son," and to carry on the same and the business of smelters and refiners of ores, agents for the sale of drugs and chemicals, oil-refiners, essence-manufacturers, makers of and dealers in photographic, surgical, and scientific apparatus and materials, &c. The first subscribers are: H. Wilson, 146 High Street, Southampton, pharmaceutical chemist; A. V. Heanley, 146 High Street, Southampton, pharmaceutical chemist; H. Rayson, The Manse, Milford-on-Sea, pharmaceutical chemist; W. Priestman, Langley House, Newport, Isle of Wight, pharmaceutical chemist; A. F. Goode, King Edward Road, Nuneaton, pharmaceutical chemist; F. Oram, Market Place, Romsey, pharmaceutical chemist; and A. Mumford, Emsworth, Hants, pharmaceutical chemist. The number of directors is not to be less than two nor more than five; first are Harry Wilson (permanent governing director; special qualification, 2,000l.) and H. Rayson. Ordinary qualification, 50l. Remuneration, as fixed by the governing director. Registered office, 146 High Street, Southampton.

PARIS ACADEMY OF MEDICINE.—M. Calmette, professor at the Lille Faculty and Director of the Pasteur Institute of that town, was elected a corresponding member of the Paris Academy of Medicine last week. M. Calmette is well known for his researches in connection with the discovery of a serum against the bites of serpents.

Business Changes.

MR. J. PHILLIP has purchased a drug business at 21 Nelson Street, Greenwich, S.E.

MR. W. H. LYON, chemist, has purchased the business of the late Mr. S. Dean, 320 Roman Road, Bow.

MR. ARTHUR E. BAYLIS has opened a pharmacy at No. 1 The Exchange, Church Street, Great Malvern.

MR. E. WALLIS, dispensing chemist, has removed from 95 High Road, to 20 Mitcham Lane, Streatham, S.W.

"THE KINGSTON DRUG-COMPANY" is the title of a new pharmacy being fitted up at 51 Fife Road, Kingston-on-Thames.

MR. G. T. KEMP, chemist and aerated-water manufacturer, of Eign Street, Hereford, has taken his assistant, Mr. Brook, into partnership, and will trade in future as Kemp & Brook.

MESSRS. S. F. GOSS (LIMITED), dispensing chemists, in consequence of the pending demolition of their premises at 3 Sloane Street, S.W., are shortly removing to 460 Oxford Street, W.

MR. ALFRED HIGGS, chemist and druggist, Richmond Road, Kingston-on-Thames, has re-opened the premises lately vacated by Mr. Waley at Market Place, Kingston, and will carry on the business under the name of "Stewart's Drug-stores."

Trade Notes.

FEATHER DUSTERS.—There is plenty of dusting to do in chemists' shops, but it is impracticable to dust everything each morning. A usual practice is to dust the shop-rooms and pots once a week and between times to use a feather-duster. Feather-dusters are also excellent articles for use in cases where the counter is covered with goods and the shop is in a dusty situation. Mr. H. A. Wanklin, 17 Manchester Avenue, E.C., is advertising in this issue special-quality feather-dusters for chemists' use, which, judging from a specimen we have examined, are good value.

BATH-GAUNTLETS.—Messrs. Solport Brothers, 188 Goswell Road, E.C., send us samples of a new bath-gauntlet which



they are introducing and which is a distinct improvement on the ordinary bath-glove. Everyone who has used a bath-glove has experienced the difficulty of keeping it on the hand, especially if the glove is used at all vigorously. The new bath-gauntlets are fitted with thumbs, and have elastic bands at the wrist, so that when a glove is put on it fits the hand fairly tightly. The style of gauntlet is shown in the illustration, and, as a variety of attractive patterns is made, there is not much doubt but that the public will readily appreciate the new toilet-requisite. The prices are moderate and the quality of the material good.

ACETOZONE.—Messrs. Parke, Davis & Co., 111 Queen Victoria Street, E.C., bring to our notice a new antiseptic—Acetozone, formerly known as Benzozone. Acetozone, or benzoyl-acetyl peroxide, is crystalline in form, melts at 98° F., and is decomposed by heat. It is sent out diluted with an equal weight of inert powder, this precaution being taken so that the substance can be handled with safety. If suddenly heated, acetozone decomposes with explosive rapidity, especially if contained in a tightly-stoppered bottle. It should be kept from contact with organic matter and away from moisture, as both moisture and organic matter slowly decompose it. Acetozone is slightly soluble in alcohol and fairly so in ether, chloroform, and carbon tetrachloride. It is soluble in water to the extent of about 1 per mille, and is used as an antiseptic in aqueous solution. It should be noted that the solution will be cloudy from the presence of the absorbent powder (probably kieselguhr) alluded to above, and also from benzoic acid produced by the hydro-

lysis of the acetozone. In dispensing the solution is filtered through glass-wool, or decanted if required for use as a spray or hypodermic injection, and it is not advisable to use the aqueous solution if it is more than forty-eight hours old. Acetozone is used as a general antiseptic for wounds and as an injection for gonorrhoea, and the fact that a solution of acetozone possessing germicidal power equal to that of a 1-per-mille solution of mercuric chloride can be taken internally in large quantities without any unpleasant results indicates the comparative harmlessness of the substance. As yet there are few clinical reports of its use, but it is probable that chemists will soon be called upon to dispense this new remedy.

Personalities.

MESSRS. E. RIMMEL (LIMITED), perfumers, 19 and 21 Oxendon Street, Haymarket, W., have appointed Mr. G. H. Bishop to be their sole representative for the United Kingdom.

DR. F. B. POWER, of the Wellcome Research-laboratory, is now in the United States. A party of Baltimore pharmacists gave him a supper in Electric Park one evening in July.

COUNCILLOR A. E. EKINS, Mayor of St. Albans, was invited to attend the Coronation ceremony on August 9. The honour, however, was declined, as the Mayor considered it his duty to remain in St. Albans, and preside over the festivities there.

MR. R. WIDDOWSON, of the Midland Drug Company, Nottingham, has won the prize this month offered by *Advertising* for the most original advertisement. The ad. in question consisted of a window-display relating to the extraction of teeth.

DR. B. H. PAUL has resigned the Editorship of the *Pharmaceutical Journal*, which he has held since 1870, although for twenty years previously he had been the chief scientific contributor to the periodical. Dr. Paul will retain his position until the Council of the Society find a suitable successor, and afterwards will devote himself solely to his analytical and consulting practice.

The council of University College, Liverpool, have agreed to invite Dr. Benjamin Moore to accept the chair of biochemistry. Dr. Moore, who is now lecturer on physiology in the Charing Cross Medical School, received his college training at Queen's College, Belfast. In 1891 he proceeded to Leipzig University, and afterwards to University College, London, where after a time he took charge of practical classes in physiology and histology, being subsequently elected to an assistant professorship. In 1898 he was invited to the chair of physiology in the Medical School of Yale University. After two years he returned to England as lecturer at the Charing Cross Medical School.

Marriages.

DEANS—MITCHELL.—At the Palace Hotel, Aberdeen, on August 12, by the Rev. J. S. Stewart, Rutherford U.F. Church, Rosemount, Alfred Deans, pharmaceutical chemist, Maidstone, Kent, to Blanche Alice, second daughter of Mr. George Mitchell.

GILL—BRANDRETH.—On July 31, at the Calvinistic Methodist Church, Bettws-y-coed, by the Rev. J. C. Smith, of Willesden, Mr. Harry B. Gill, son of the late George H. Gill, of Kirkwood, Mo., U.S.A., to Adeline Florence, daughter of Mr. Henry D. Brandreth, Lledr House, Dolwyddelan.

HODSON—SKINNER.—On August 4, at Keelby Parish Church, by the Rev. H. L. Browne, E. Hodson, of Newcastle, to Maud Skinner, daughter of the late Mr. H. Skinner, chemist.

HYNE—NETTING.—On August 11, at St. Peter's Church, Plymouth, by Rev. H. E. Hudson, M.A., Arthur E. Hyne, R.N., to Mabel Alice, younger daughter of Mr. J. G. Netting, chemist, 159 North Road, Plymouth.

MARTIN—CROSBY.—At St. Andrew's Church, Lincoln, on August 4, by the Rev. W. Watt, Henry Arthur Martin, chemist, of Leicester, to Florence Annie, eldest daughter of Mr. Joseph Crosby, of Lincoln.

RALPH—SMITH.—At Portsea Parish Church, by the Rev. C. F. Gorbett, William Ralph, pharmaceutical chemist, Lee, S.E., to Mabel Louise (Maggie), daughter of the late Mr. Wm. Smith, Southsea.

Deaths.

BELL.—At 130 Tooley Street, S.E., on August 8, Mr. George Bell, chemist and druggist.

DRYSDALE.—On August 3, at 30 Nottingham Place, W., Mr. Hector Drysdale. Aged 75. The late Mr. Drysdale was senior partner in the old-established firm of Messrs. Drysdale, Dennison & Co., spice merchants, 131 Upper Thames Street, E.C., and was well known and highly respected throughout the spice and drysaltery trades.

RICHARDS.—On August 6, at Bonn, Mr. W. A. Richards, works manager to Messrs. Brunner Mond & Co., chemical manufacturers, Sandbach. Mr. Richards had been works manager at Malkins Bank for twenty-two years.

ROBBINS.—On August 8, at 57 Warrington Crescent, W., John Robbins, F.C.S., pharmaceutical chemist. Aged 78. Mr. Robbins was born at Launceston, and passed the Major examination in 1854. He came to London from Launceston in 1860 as assistant to Messrs. Garden & Son, 147 Oxford Street, W., whose business he, after a few years, acquired. Messrs. A. and F. R. Garden retired from the business in 1865, it having been carried on as Garden & Robbins for a couple of years previously. It is interesting to note that the business in Oxford Street was opened by Mr. Garden, sen., early in the nineteenth century, Mr. Garden having been previously a partner with Mr. Frederick Accum, a well-known writer on chemistry, who was in business at Compton Street, Soho. Mr. Garden, sen., died in 1867, Mr. F. R. Garden in 1872. Mr. Robbins was elected to the Council of the Pharmaceutical Society in 1873, and was chosen to the office of Treasurer in 1880, when Mr. Greenish was elevated to the Presidency. Mr. Robbins retired from the Treasurership and the Council in 1890. The Oxford Street business was carried on under the style of J. Robbins & Co., Mr. Percy John Robbins, pharmaceutical chemist, having been with his father for some time. The business was moved to Wardour Street in 1898, and in 1900 was sold to Mr. Owen Wallis, pharmaceutical chemist, who had been with the firm for some years previously. Mr. Robbins had been a member of the British Pharmaceutical Conference from its foundation in 1864, and a Fellow of the Chemical Society from 1872. His scientific work covered a wide range of subjects; as early as 1859 he published communications on the adulteration of lozenges, magnetic peroxide of iron, and pyrophosphate of iron, but it is in connection with work on ozone and peroxide of hydrogen that he is best known. At an evening meeting of the Pharmaceutical Society in 1864, Mr. Robbins described a method he had patented of preparing oxygen by adding dilute acid to "oxygenesis," a powder composed of peroxide of barium and bichromate of potassium. His work on ozone and peroxide of hydrogen was turned to commercial account in the preparation of the well-known ozonic ether. Mr. Robbins assisted in the experimental work of the late Sir Benjamin W. Richardson, preparing for him a number of new anaesthetics; the most promising of these was methylene, which is still manufactured very largely. Peroxide of hydrogen, it may be mentioned, was first introduced into medicine by Sir B. W. Richardson, and was manufactured for him by Mr. Robbins. Ethylate-of-sodium solution, which after many years obtained pharmacopoeial recognition, is another medicament which was perfected by these two experimenters. Mr. Robbins leaves a widow, five sons, and a daughter. The funeral took place at Paddington Cemetery, Willesden Lane, on August 13.

ROBINSON.—On July 27, at his residence at Ilkley, aged 78, Mr. S. Robinson, who was for forty-six years representative of Messrs. Robinson & Sons (Limited), of Wheat Bridge, near Chesterfield.

Recent Wills.

BAKER.—The will (with two codicils) of the late Mr. William Garrad Baker, of 9 Compton Avenue, Brighton, and of Southlands, Grove Road, Sutton, manufacturing chemist, formerly of Messrs. May & Baker (Limited), Battersea, who died on May 16, has been proved by Mr. Archibald Henry Baker, 7 Great James Street, Bedford Row, W.C., solicitor, the son, the executor named in the will, and Miss Florence Mary Baker, of 9 Compton Avenue, Brighton, spinster, daughter of the deceased, the executrix named in the codicil. The gross value of the estate is 871*l.* 6*s.* 7*d.*, and the net personality 391*l.* 11*s.* 8*d.*

GREEN.—Mr. Henry Stephenson Green, aged 72, manufacturing chemist, Moss Side, Manchester, has left a gross estate of 4,838*l.* 8*s.* 8*d.*

FALKNER.—Letters of administration to the estate of the late Mr. Richard Falkner, chemist and druggist, of the Warneford Asylum, Oxford, and late of Banbury, have been granted to deceased's sister, Miss Anne Maud Falkner, 11 Bevington Road, Oxford, spinster, and one of the next-of-kin. The gross estate is valued at 10,813*l.* 0*s.* 3*d.*, and the net personality 10,778*l.* 0*s.* 3*d.*

MARSHALL.—Letters of administration to the estate of the late Mr. John William Marshall, chemist and druggist, who died at the Leicester Borough Asylum, have been granted to Mr. William Marshall, caretaker of the Board school, by whom the estate is valued at 116*l.*

SMITH.—The will of the late Mr. John Ord Smith, pharmaceutical chemist, of 2 Glenshaw Mansions, 63 Brixton Road, S.W., formerly of New Bridge Street, E.C., who died on July 15, 1901, has been proved in the Principal Probate Registry by his widow, Mrs. Clara Sarah Smith. The gross value of the estate is 2,270*l.* 8*s.* 1*d.*

DRUG-TRADE APPEAL FUND.

The following subscriptions to the Fund have been received during the week by the Acting Secretary, Mr. W. S. Glyn-Jones, 184 Temple Chambers, Temple Avenue, E.C. The Fund now amounts to over 533*l.*, which is over half-way to the 1,000*l.* needed to start operations.

	£	s.	d.		£	s.	d.
Howard & Sons, Stratford ...	10	10	0	Mrs. F. Andrews, Leinster Terrace ...	0	10	0
Sulton & Co., Chiswell Street ...	5	5	0	H. S. Durbin, Surbiton ...	0	5	0
F. Newbery & Sons, Charterhouse Street	5	5	0	J. Lloyd, Chelsea, S.W.	0	5	0
W. H. Martindale, New Cavendish Street, W. ...	2	2	0	G. Dickinson, Highgate ...	0	5	0
E. B. Stamp, Hampstead, N.W. ...	1	1	0	T. Fawcett, Bartholomew Close ...	0	5	0
J. Rymer Young, Warrington ...	1	1	0	H. B. Hines, Holloway, N. ...	0	5	0
J. Humphrey, Bloomsbury Square ...	1	1	0	S. Falkny, Kingsland Road ...	0	5	0
J. B. Birkbeck, Lincoln ...	1	1	0	J. H. Thursfield, Kettering ...	0	5	0
W. H. Goy, Clapham	1	1	0	G. Rae, Fulham ...	0	5	0
E. H. Taylor, Woking	1	1	0	J. Hearle, Islington ...	0	5	0
H. J. Pavey, Rams-gate ...	0	10	6	G. Waite-Wilson, New Cross ...	0	5	0
A. J. Wiug, Woolwich	0	10	6	G. Reade, Westminster ...	0	5	0
J. H. Gostling, Halesworth ...	0	10	6	R. C. Davenport, Bromley ...	0	5	0
F. Gibson, Birmingham ...	0	10	6	J. Lloyd Davies, Mare Street, N.E. ...	0	5	0
Swire & Co., Brixton, S.W. ...	0	10	6	L. B. Rowland, Wrexham ...	0	5	0
Barnard & Sons, Hackney Road, N.E.	0	10	6	J. W. Baugh, Ongar	0	2	6
W. Warren, Russell Street ...	0	10	0	E. C. Rowland, Dalton ...	0	2	6
A. W. Hall, Fulham Road ...	0	10	0	M. H. Arundel, High-bury, N. ...	0	2	6
H. Dixon, Kensington, W. ...	0	10	0	J. Francis, Alexandra Park ...	0	2	6

Trade Report.

NOTICE TO BUYERS.—The prices given in this section are those obtained by importers or manufacturers for bulk quantities or original packages. To these prices various charges have to be added, whereby values are in many instances greatly augmented before wholesale dealers stock the goods. Qualities of drugs and oils vary greatly, and higher prices are commanded by selected qualities even in bulk quantities. It would be unreasonable for retail buyers to expect to get small quantities at anything like the prices here quoted.

42 Cannon Street, London, E.C.: August 14.

THE chief interest this week has centred in opium, and the market has advanced, both here and in Smyrna, chiefly owing to native speculation. Whether the improvement is going to last, in face of one of the largest crops on record, it is difficult to say. Morphine has, of course, followed opium, and values show an advance of quite 6d. from the lowest point; but we understand makers have withdrawn their quotations. A considerable reduction has been made in pilocarpine, owing to better supplies of jaborandi. Valencia saffron is firmer, and there is still delay in the deliveries of new Belgian chamomiles, owing to unfavourable weather. Essential oils are quieter this week, but American HGH and best brands of Wayne County oil are firm, and, according to the state of affairs in the producing districts, the advance is likely to be maintained. Indeed, this fact may also apply to American crude drugs in a greater or less degree. Quinine is a shade firmer in second-hands, but hard to move. Soda tart. and pulv. seidlitz are dearer. Subjoined are the principal changes of the week:—

Higher	Firmer	Easier	Lower
Cocoa-butter Morphine Oil, spearmint Opium Pulv. seidlitz Soda tart.	Quinine (sec. hands) Saffron		Ammonia sulphate Lobelia Nutmegs Pilocarpine

Arrivals.

The following drugs, chemicals, &c., have arrived at the principal ports of the United Kingdom from August 6 to 13, inclusive:—Acetate of lime (@ New York), 958; acetone (@ Hamburg), 10; acid, acetic (@ Rotterdam), 22 blns. 65 pkgs.; acid, boric (@ W.C.S. America), 11; acid, citric (@ Bordeaux) 28, (@ Rotterdam) 10 kgs.; acid, tartaric (@ Rotterdam) 41, (@ Bordeaux) 8; agar-agar, 50; aniseed (@ Marseilles), 25; annatto-seed (@ Hamburg), 100; antimony (@ Hamburg), 50 cs.; arrowroot (@ St. V.) 276 tins 683 brls. 26 cs.; arsenic (@ Antwerp) 243, (@ Hamburg) 10; bleaching-powder (@ Hamburg), 161; benzoin (@ Singapore), 30; borax (@ Hamburg), 20; bromine (@ Hamburg), 40; buchu, 11; camphor (@ Hamburg), 125 tubs; cardamoms, 58; canary-seed 70, (@ Morocco) 126, (@ Constantinople) 350; caraway-seed (@ Rotterdam) 114, (@ Amsterdam) 50; cascara sagrada, 318; castor oil (@ Antwerp) 448 brls., (@ Coconada) 30 cks., (@ Marseilles) 227 brls., (@ Calcutta) 566 cs.; cinchona (E.I.) 173 brls., (@ Madras) 23; citronella oil (@ Galle), 129 pkgs.; cochineal, 10; cod-liver oil (@ Norway) 25, (@ Aalesund) 279, (@ Bergen) 36; cream of tartar (@ Marseilles) 6, (@ Bordeaux) 332, (@ Rotterdam) 29; cumin-seed (@ Morocco) 19, (@ Malta) 90; dragon's-blood, 5; drugs (@ Rotterdam) 13 bls. 18 pkgs. 30 cs., (@ Havre) 144 cs., (@ New York) 48, (@ Antwerp) 3, (@ Boulogne) 6, (@ Trieste) 27, (@ Messina) 21 bgs., (@ Hamburg) 6, (@ Antwerp) 10, (@ Monte Video) 45; essential oils (@ Marseilles) 6, (@ Ostend) 7, (@ Boulogne) 8, (@ Messina) 10 cs. 40 ½ cs. 97 pkgs., (@ Palermo) 10 cs., (@ Flushing) 6; fenugreek-seed (@ Morocco), 133; gentian (@ Marseilles) 9, (@ Bordeaux) 21; ginger (@ Jamaica) 236, (@ Bombay) 85; glycerin (@ Adelaide), 132 cks.; gum arabic (E.I.) 100, (@ Suez) 133; gum, unenumerated (@ Bombay), 100 bgs.; gum tragacanth, 68 cs.; honey (@ Jamaica) 158, (@ New Zealand)

40 cs., (French) 15 brls., (@ New York) 20, (Chilian) 50 pkgs.; ipecacuanha (@ Singapore), 10; kola (@ Grenada), 5; lemon-peel (@ Antwerp), 21 cs.; lime-juice (@ Dominica) 174 pkgs., (@ Montreal) 14, (@ Jamaica) 2 pns.; lime oil (@ Dominica), 12 pkgs.; liquorice-juice (@ Palermo) 10 cs., (@ Naples) 15; liquorice extract (@ Seville), 100 cs.; liquorice-root (@ Seville) 35 cs. 45 sks.; manna, 1; nux vomica, 83; oil, olive (@ Spain) 20 cs., (@ Corfu) 3 brls. 26 cks., (@ Gallipoli) 326 cks., (@ Messina) 15 cks., (@ Bordeaux) 702 cs.; olibanum (@ Bombay) 52; olive oil (@ Bordeaux), 263 cs.; opium (@ Smyrna) 136, (@ Colombo) 4, (@ Constantinople) 14, (@ Calcutta) 32; orris (@ Hamburg), 8; pepper (@ Bombay) 400, (@ Singapore) 365; pot. caustic (@ Hamburg), 13; pot. oxalate (@ Rotterdam), 4; pimento, 232; quillaia (@ Valparaiso), 1,171 bls.; rape-seed, 50; rhubarb, 56; "roots" (@ New York) 37, (@ Marseilles) 128 bls.; saffron, 1 ck.; sal ammoniac (@ Amsterdam) 23, (@ Hamburg) 10; sarsaparilla (@ Jamaica), 7; sandarac (@ Morocco), 38; scammony-root, 25; senna (Tinnevely) 290, (@ Suez) 20 *in tr.*; shellac 1,412, button lac 232; soda acetate (@ Antwerp), 20; soda bicarbonate (@ New York), 550 kegs 84 pkgs.; soda crystals (@ Dusseldorf) 360 cs., (@ Ghent) 400, (@ Amsterdam) 200; spermaceti (@ New York), 150; spices (@ Grenada), 518 pkgs.; sponges (@ Smyrna) 164 cs., (@ Marseilles) 230 cs.; tamarinds (@ Antigua), 27; tartar (@ Marseilles) 483 bgs., (@ Barcelona) 19 cks.; tragacanth, 10; turmeric (@ Bombay) 573, (@ Madras) 96; vanilla, 9 cs. (*viâ* Marseilles) 18 cs.; wax, bees' (@ Spain) 13 bls., (French) 10, (@ Suez) 3, (@ Kobé) 3, (@ Hamburg) 219, (@ Adelaide) 5, (@ Morocco) 42, 56 *in tr.*, (Chilian) 103, (*viâ* Marseilles) 444, (@ Boston) 17 cs., (@ Jamaica) 35; wax, ceresin (@ Rotterdam) 20, (@ Dusseldorf) 29; wax, bees' (@ Barcelona) 560, (@ Palermo) 393; zinc oxide (@ New York) 300, (@ Antwerp) 150.

Cablegrams.

SMYRNA, August 13:—The opium-market is advancing, holders now quoting from 6s. 10d. to 7s. 4d. per lb., f.o.b., for new crop, according to quality. There are few sellers at present prices, however, and the speculative movement has become more general.

HAMBURG, August 14:—Japanese wax is firmer at 102m. per 100 kilos. Ergot is dull of sale, and condurango-bark is lower at 70m. per 100 kilos. Peppermint oil and lycopodium are firm.

NEW YORK, August 14:—Markets here are quiet. Opium is active at \$2.70 per lb. American peppermint oil is strong at \$2.05 per lb. in bulk, and \$2.25 for HGH. Senega has advanced to 56c. per lb. Manna is firmer at 60c. per lb. Both Brazilian and Colombian ipecacuanha are easy at \$2.40 and \$1.10 per lb. respectively. Menthol is a strong market at \$4.75 per lb.

Better Trade.

The Board of Trade returns for July are better than any that have been issued for many months. There is a remarkable rise in imports, which exceed previous records. Last month they were greater by 1,058,138l. than a year ago, and for the seven months of this year they have increased almost eleven millions over the figures for 1900. The imports of raw materials, however, for sundry industries have declined by 3,500,000l. as compared with 1900, while foreign-manufactured articles present an increase of 1,600,000l. for the seven months. There was an increase of 1,643,000l. in exports last month, but the total for the seven months still shows a diminution of 1,561,000l. as against the same period last year and 7,522,000l. as against 1900. Last month we exported more goods by 1,643,000l. than in July, 1901. The exports of chemicals show an increase of 82,800l. for the month and 363,892l. for the seven months as compared with last year. Soda-compounds, bleaching-materials, copper sulphate, chemical manures, and medicinal preparations all participate in this improvement. Quinine and quinine salts of British origin was exported to the extent of 72,429 oz., against 18,800 oz. of foreign make, while the imports amounted to 67,026 oz., or 898,704 oz. for the seven months of this year.

English Essential-oil Crops, 1902.

Messrs. W. H. Hobbs & Co., Railway Approach, London Bridge, S.E., write as follows:—

PEPPERMINT.—This season the acreage under cultivation is considerably reduced, and with few exceptions the fields do not present a good appearance, as much of the herb is stunted in growth, and many bare patches are observable. Distilling will not be general for some three weeks, and it is therefore difficult to give a correct estimate, but the yield of oil will doubtless be below the average. Some growers, indeed, state that it will be the shortest for many years, but with favourable weather prospects may improve. Prices are expected to range from 26s. to 30s. per lb.

LAVENDER.—This looks well in all districts, particularly the three-year-old plants, and although an abundant yield such as last

season can hardly be expected, a crop of oil above the average should be available.

CHAMOMILES.—Only a small quantity is under cultivation, but the plant looks well, and should give good results.

The Senega-market.

The *Winnipeg Commercial* of July 19 states that the senega-root situation is an interesting one at present. A state of nervous tension exists in the trade at Winnipeg, and it would not take very much to unsettle the market badly. Senega closed very high last season, and the cold, wet weather which prevailed up to the end of June this year prevented digging, which tended to give prices a buoyancy which was most unusual for the opening of a season. The fine weather which has prevailed so far this month has given diggers a chance to get to work, and the next few weeks may witness such an increase in the receipts of root that prices will decline sharply. It is generally believed that the market is now too high for safety, and consequently no dealer is willing to load up with root at these figures. It is quite true that a certain amount of root must be had before the end of this season to satisfy the regular demands of the trade, and if it takes high prices to do it this root will be secured, but there are no people in the trade at Winnipeg who care to take the chance of buying any quantity at present prices, unless they have an order for the goods. Another week or two should determine the course which the market is likely to take, as present prices are high enough to tempt every digger out.

ACID, TARTARIC, is quiet, at 10½d. per lb. for foreign, and English 11½d.

The exports from Barcelona during 1901 amounted to 1,221 tons (84,864l.), against 1,104 tons (83,612l.) in 1900. Of tartar, 4,396 tons (89,926l.) were exported, against 3,500 tons (79,803l.) in 1900.

ALOE.—We understand that the sale of the parcel of Curaçao aloes in auction last week, "subject to sellers' approval," was subsequently ratified. Some 20 kegs of Socotrine have been shipped to the United States this week.

ANGELICA-ROOT.—It is reported from Saxony that the cultivation of angelica root proved very remunerative last year, 45m. per centner having been paid for the dried root. The cultivation is somewhat laborious, requiring a great deal of care, and is said not to be so extensively carried on as it was fifty years ago. At present the chief markets are England, Austria, and France.

ARROWROOT.—Slow; at auction on Wednesday the parcels of St. Vincents offered were bought in at 2½d. to 3d. per lb. for fair to good.

BALSAM, CANADA, remains scarce. Importers quote 2s. 2d. per lb., c.i.f., in casks, and 2s. 4d. in cases.

BALSAM, PERU.—An advice from Leipsic states that, on account of the very large stocks, both on the Continent and the producing-centres, prices will in all probability decline further.

BLEACHING-POWDER is slow of sale, at 7s. per cwt., spot, or 5s. 6d. to 6s., f.o.b., Liverpool, in softwood casks, and 6s. to 6s. 9d. in hardwood casks, according to market. Foreign make is quoted 6s. 9d. to 7s., ex wharf.

CASCARA SAGRADA.—It is thought this article will be dearer later, as there is a remarkable absence of forward offers. Meanwhile importers quote old bark (1899) crop at 26s. per cwt. on the spot. The s.s. *Hermonthis* has arrived with 318 packages from San Francisco.

CHAMOMILES.—The weather has delayed the new crop in Belgium, and prices are still unsettled. For prompt shipment one seller quotes first pickings slightly brownish at 56s. to 57s. 6d. per cwt. ex wharf.

CINCHONA.—The auction to be held at Amsterdam on August 28 will consist of 8,594 bales and 356 cases, weighing 784,142 kilos.

The exports from British India during the two months ending May amounted to—

Lbs.	...	1902	1901	1900
		500,595	528,459	1,201,659

COCOA-BUTTER.—In auction, 20 tons of Cadbury's brand were offered, and sold at 1s. 1½d. to 1s. 1½d. per lb., or about ¾d. dearer.

CREAM OF TARTAR is quiet, at 78s. 6d. per cwt. for 98-per-cent. powder and 76s. for 95-per-cent. powder.

CUMIN-SEED.—Mogador of the new crop is quoted at 19s. per cwt., spot.

DRAGON'S-BLOOD.—Three cases of fair lump have arrived.

GAMBOGE.—After the auction last week two cases were sold at 13l. per cwt. for good Siam pipe, rather blocky, but of bright orange fracture, for which 12l. was refused in the sale.

GUAIACUM.—Five cases of block have arrived.

GUM SENEGAL.—The exportation of this product from the French colony of Senegal during 1901 amounted to 3,149 tons (116,438l.), against 2,450 tons (92,682l.), which was all shipped to France.

IPECACUANHA.—The s.s. *Clyde*, from Monte Video, has arrived with 45 packages of "drugs," and the s.s. *Moyune*, from Singapore, has brought 10 bags of East Indian ipecac. Since the auctions a fair quantity of cultivated Rio has been sold, at from 8s. 10½d. to 9s. per lb.

JABORANDI.—The s.s. *Bourbon* has arrived in Liverpool with 56 bags from Tutoia and 26 bales in transit.

KOLA.—Last year there were imported into Senegal from Sierra Leone, kola valued at 139,956l., more than double that amount of the previous year. This amount, however, is determined upon an assessed value of 6s. per kilo. for taxation purposes. The real estimate would be approximately 17,494l. Kola of French origin is assessed at 3s. per kilo., as the Government wish to encourage the import from the colony of French Guinea, where small quantities are grown. The natives throughout the West Coast of Africa are extremely partial to kola (says the British Consul of Senegal) to which they attribute properties of a stimulating and aphrodisiacal nature. The most productive localities are situated in the Hinterland of Sierra Leone.

LOBELIA is offered at lower rates, the pressed herb being quoted at 7d. and loose at 4½d. per lb. on the spot.

MENTHOL is unchanged but firm on the spot, at 17s. per lb. for Kobayashi crystals, other brands being obtainable at from 15s. 6d. to 16s.

MORPHINE.—An improvement has taken place in this alkaloid owing to the advance in opium, and makers are no longer quoting the former low prices of 3s. 2d. to 3s. 3d. which prevailed at the beginning of the month. Values are quite 6d. per oz. dearer to-day, business having been done at 3s. 8d. per oz., and it is said makers have temporarily withdrawn their quotations.]

OIL, CASTOR, is quiet at 28s. 6d. per cwt. in barrels, and 31s. in cases, ex-wharf for French medicinal. Belgian is quoted 25s. 6d., spot, for firsts, and 23s. for seconds. Hull make for November-December delivery is offered at 24l. 5s. per ton and 23l. 15s. for January-April delivery, ex-wharf London. Calcutta seconds are steady but quiet at 2½d. per lb., spot.

OIL, COD-LIVER.—The Bergen cod-liver oil market is nominally unchanged at 135s. per barrel, f.o.b., for finest non-congealing oil. The tendency is weak. The exports from Bergen to date amount to 5,514 barrels, against 6,455 barrels at the same time last year. The London market is quiet, agents quoting 140s. to 145s., c.i.f.

OIL, LEMON.—Messina make of the new crop is quoted at 2s. 11d. per lb., c.i.f., for prompt shipment, and 2s. 7d. for old crop.

OIL, PEPPERMINT, is unchanged but firm, with further sales of American HGH at 10s. 6d. per lb., and 10s. 9d. is now wanted, London terms. Good Wayne County oil has been sold at from 8s. 10d. to 9s. net, the latter price being paid for McK. and R. brand. Several prominent American houses are said to have been buying up all the old stocks of oil in the United States, so that it is probable the advance will be maintained for some time.

OIL, SPEARMINT, has been advanced to 6s. 6d. per lb., c.i.f., in bulk, and HGH to 8s., both net.

OPIUM.—The London market has shown more activity than for some time past, and a fair quantity of manufacturing descriptions have been sold at an advance of about

3*l.* per lb. The business done includes good Persian at 8*s.* on the spot, but practically no more is to be had; common Persian is plentiful. There are buyers to arrive at 8*s.* 3*l.*, but no sellers. Karahissars have been sold at 7*s.* 6*l.* to 7*s.* 9*l.*, Tokat seconds at 8*s.* 6*l.*, and fine Tokat, which is very scarce, at 15*s.* 6*l.* to 15*s.* 9*l.* per lb., spot. Speculative buying in Smyrna is responsible for the advance.

SMYRNA, August 1. — The market has been excited, and higher prices are asked. The sales amount to about 68 cases, comprising 50 cases new talequale at from 6*s.* 7*l.* to 6*s.* 9*l.* per lb.; 15 cases new current Yerli at 7*s.* to 7*s.* 2*l.*; and 3 cases old talequale at 7*s.* 4*l.* per lb., c.i.f. Twelve cases of the above were for speculative account. The arrivals in Smyrna amount to 2,145 cases, against 1,152 cases at the same time last year. A large proportion of the recent arrivals has been deposited with the bankers, who have advanced about 90 per cent. of the value, so that they are not anxious to sell at present prices. The stock in Smyrna now amounts to about 3,646 cases, against 2,356 cases at the same time last year, and in Constantinople 614 cases, against 404 cases.

PILOCARPINE.—A startling reduction of 14*s.* per oz. has been made this week, makers now quoting 1-oz. lots at 48*s.* per oz. for muriate and nitrate; 8-oz. lots are subject to a proportionate reduction; 1-gram lots are quoted 2*s.*, and 5-grams 1*s.* 10*l.* One-ounce lots of pure are 62*s.* per oz., 5-gram lots 2*s.* 3½*l.*, and 1-gram, 2*s.* 6½*l.*, all net. In second-hands there are sellers at slightly below the above quotations.

QUICKSILVER.—The output of quicksilver in the United States during the past year amounted to 29,727 flasks, and 76½ lbs., showing an increase against the previous year of 1,410 flasks. California contributed 26,720; Texas 2,932; and Oregon 75 flasks. The quantity exported from San Francisco during 1901 was 5,337 flasks, the bulk of which went to Mexico and Central America. In spite of the larger production, the stock in reserve, including that of New York, was only 2,230 flasks. Two new mines have swelled the number of producers in California, both in San Luis, Obispo County. California has produced practically all the quantity obtained in the United States, and since 1850 the total yield in California was 1,884,059 flasks, half of which was turned out by one mine alone, the New Almaden in Santa Clara County. The United States exports of 1901 totalled 11,219 flasks against 10,172 in 1900. The total world's production, which in 1898 was 3,796 metric tons, fell off steadily, and amounted in 1900 to only 3,152 tons. The United States and Spain are the largest producers, the latter country's returns in 1898 being 1,631 tons; in 1899, 1,361 tons; and 1900, 1,035 tons. It is reported that in Texas, where pockets of cinnabar are found, the mining and smelting of quicksilver is being developed. The exports from Italy during the five months ending May amounted to:—

	1902	1901	1900
Kilos. ...	97,300	119,600	83,200
Lire ...	555,000	682,000	499,000

The exports from Spain for the same period were:—

	1902	1901	1900
Kilos. ...	971,627	608,815	45,521

QUININE.—Very quiet, but a shade firmer in second hands a small business having been done at 10½*l.* per oz. on the spot and December delivery at 11*l.* On Wednesday there were further buyers at 10½*l.*, but no sellers.

The exports of quinine, quinine preparations, &c., from Germany during the five months ending May amounted to:—

	1902	1901	1900
Kilos. ...	84,400	88,700	89,500

SAFFRON is firmer, the price for fines Valencia now being 25*s.* per lb.

SCAMMONY.—An arrival of 25 bags has taken place—not 225 casks, as reported in the bill of entry; 27*s.* 6*l.* is quoted, and business is reported at this figure.]

SENEGA.—Nothing doing this week, and value is unchanged at 2*s.* 6*l.* per lb., net.

Reviewing the senega-market in their latest circular, the McMillan Fur and Wool Company of Minneapolis say: The senega-market is bare of old root, and it will take 25,000 lbs. to supply the immediate demand. We never started senega so high as this year; have formerly started the new crop from 18*c.* to 25*c.* At our high prices diggers can make big wages. High prices stimulate production, and we believe an average crop will be dug. If so, prices may decline to 30*c.* to 33*c.*, delivered in Minneapolis.

SHELLAC.—The week commenced with a good spot demand on a basis of 107*s.* per cwt. for fair second orange TN, but since then there has been a weaker feeling, sales being made at 104*s.* to 105*s.* for fair, cash terms. At auction only 100 cases of button lac offered, of which 50 sold "without reserve" at 97*s.* down to 61*s.* per cwt.

SODA TART.—Messrs. Howards & Sons have advanced their prices for soda tart. pulv. 3*s.* per cwt., and pulv. seidlitz 2*s.* 3*l.* per cwt., the quotations now being as follows:—Soda tart. pulv., in 5-cwt. casks, 67*s.*; ditto, in 28-lb. parcels, 70*s.* Pulv. seidlitz, in 5-cwt. casks, 57*s.* 3*l.*; and 28-lb. parcels, 53*s.* 6*l.* per cwt.

SPERMACEIN.—Refined remains cheap, being obtainable at 11½*l.* to 1*s.* per lb. spot, according to quantity.

SPICES.—There was no Cochin *Ginger* offered at the auctions on Wednesday, but the quotation is steady at 42*s.* per cwt. for washed rough. A parcel of Bengal was bought in at 45*s.*, the price required being 42*s.* per cwt. Rough lime Japan was bought in at 34*s.* per cwt., but business is doing privately at that price for fair quality. Jamaica is in small supply, but the demand was slow, and only a few lots sold at 36*s.* 6*l.* to 39*s.* per cwt. for ordinary dull, and at 52*s.* for bold. Zanzibar *Cloves* are quiet at 3½*l.* per lb. on the spot, and at 3½*l.* for future delivery. Zanzibar *Chillies* were bought in at 35*s.* to 40*s.* per cwt. for common to fair, fine Nyassaland at 50*s.*, and fine long Japan at 33*s.* per cwt. *Capsicums* were also neglected, and were bought in at 23*s.* to 25*s.* per cwt. for East India, and at 45*s.* for fine Egyptian. West India *Nutmegs* were in good supply, and declined about 1*l.* per lb. *Mace* steady, fine bold pale Penang sold at 2*s.* 10*l.* per lb. *Pimento* partly sold at 2½*l.* per lb. for fair. *Cassia-vera* was bought in at 25*s.* per cwt. *Cinnamon-chips* were bought in at 3*l.* per lb. Black *Pepper* firm, good Alleppy sold at 5½*l.* to 5½*l.* per lb. Singapore is quoted 5½*l.* per lb. on the spot, and 5½*l.* for August-October shipment. Fine Singapore white sold at 10½*l.* per lb., the quotation for fair is 9½*l.* per lb. Penang was bought in at 8½*l.* per lb.

STROPHANTHUS.—According to the figures furnished by the Commissioners of the British Central Africa Protectorate, there was a considerable increase in the shipments of strophanthus, the declared value for 1901-2 being 1,193*l.* 18*s.*, against 247*l.* 6*s.* for 1900-1.

SUGAR OF MILK.—At the sitting of the Customs Tariff Committee of the German Reichstag on August 11, the duty on sugar of milk was increased from 40*m.* to 80*m.* per 100 kilos.

TURMERIC.—Further sales of Bengal have been made to arrive at 9*s.* 9*l.* per cwt., c.i.f., and fine bright Madras finger has been sold at 18*s.*, and Calicut kind at 13*s.*

VANILLA.—The export of vanilla from Port Louis in 1901 amounted to 4,570 kilos., valued at 197,090*r.*, against 4,553 kilos., valued at 163,821*r.* in 1900. Of this 2,976 kilos. went to Great Britain, and 1,594 kilos. to France

WAX, JAPANESE.—Sales of good squares have been made at 52*s.* 6*l.* per cwt., spot, and 55*s.* is now asked.

The exports from Japan during the five months ending May amounted to:—

	1902	1901	1900
Kin. ...	1,539,016	1,435,937	1,791,412
Yen. ...	238,000	214,000	273,000
	Kin. = 1-3 lb. avoird.		
	Yen. = 2 <i>s.</i> 0½ <i>l.</i>		

Heavy Chemicals.

The general demand in the heavy-chemical market, both for main and miscellaneous products, continues fairly good. Home-trade demand keeps up very well indeed, and appears likely to do so. New business is moderately plentiful, and already inquiries are afloat for next year's deliveries. Foreign trade is, perhaps, scarcely what could be desired. Values all round are steady, and well maintained at practically unaltered rates.

ALKALI PRODUCE.—Bleaching-powder, ammonia alkali, and caustic soda, as well as soda crystals, are all in active request. Chlorates, yellow prussiates, and saltcake quiet, and without improvement.

SULPHATE OF AMMONIA continues very flat, and decline in values continues. Beekton, 12*l.*; October-March delivery, 11*l.* 15*s.*; Beekton terms, 11*l.* 15*s.* to 11*l.* 17*s.* 6*l.*; London, 12*l.* 1*s.* 3*l.* to 12*l.* 2*s.* 6*l.*; Hull, 11*l.* 17*s.* 6*l.*; and Leith, 11*l.* 17*s.* 6*l.* to 12*l.*

GREEN COPPERAS, with continued steady demand, easily maintains a firm tone. For best Lancashire makes prices are steady, at 42s. 6d. to 45s. per ton, f.o.b. Liverpool. For Welsh, in bulk, free on rails, 13s. 6d. to 15s. per ton.

SULPHOCYANIDES are moving off very slowly, and recent low values continue to rule. Potassium, 7½d. to 7¾d. per lb. Barium, 95 per cent., 3¾d. to 4d. per lb. Ammonium, 95 per cent., 6d. per lb.

MAGNESIUM SALTS.—In fair request and without alteration. Magnesium chloride, 62s. 6d. to 67s. 6d. per ton. Magnesium sulphate (Epsom's), 62s. 6d. to 65s. per ton, free on rails, in bags. Carbonate of magnesia, 37s. 6d. to 40s. per cwt.

Liverpool Drug-market.

Liverpool, August 6.

CASTOR OIL.—Flatness is the leading feature of this article, 2¾d. being still asked for good selected Calcutta, and the same figure for first-pressure French. Second-pressure French is obtainable at 2½d. to 2½¾d. per lb.

CANARY-SEED.—For bright Turkish 42s. 6d. to 45s. per quarter is nominally quoted, but, as a matter of fact, no stocks are available at this price.

GRAINS OF PARADISE.—For second-hand parcels 60s. per cwt. is being asked.

SULPHATE OF COPPER is featureless at 18l. per ton.

ARSENIC.—Powdered white is steady at 13l. per ton.

GUM ACACIA.—The demand is steady, and several parcels of 20 to 30 serons have changed hands at 32s. 6d. for mixed hard amber and soft Soudan.

QUILLATA-BARK.—An arrival of 80 tons has had no appreciable effect on the value, and sales from the quay have been effected at 13l. per ton.

BEESEWAX.—A parcel of Australian was offered at auction, and a small lot of white sold at 7l. 17s. 6d.; the balance, of mixed yellow and grey, was held at 7l. 10s. to 7l. 15s. per cwt.

HONEY.—The sale of 35 barrels Pile II. Chilian is reported at 16s. per cwt. Californian is firmly held at 30s. to 40s., according to quality, in consequence of increasingly strong reports from the producing-centres.

American Drug-market.

New York, August 5.

Business is fair and of a routine character generally, but some interest is displayed in several indigenous articles.

BEESEWAX is now in good supply, and the market for ordinary yellow is easy at 29c. to 31c. per lb.

CARNAUBA-WAX is very firm owing to reduced stocks. No. 1 wax is higher at 18½c. to 20c. Inferior grades are firm at 12½c. to 17c. per lb.

CODEINE has been advanced 25c., manufacturers having come to an agreement. The inside price for bulk lots is now \$3.50.

ERGOT.—New crop is coming in; but little interest is displayed, and the market is quiet, with Russian at 39c. and Spanish at 40c.

HYDRASTIS (GOLDEN SEAL) is firmer, and 52c. is now the inside figure for prime goods.

JALAP is quiet, at 9½c. to 10c. per lb.

JAPAN WAX.—Stocks are very low, and dealers are not anxious to sell at present. Values have advanced to 11c. for goods to arrive, and further advances are expected.

MENTHOL is strong at \$4.75 to \$5.

OIL OF PEPPERMINT continues upward. For goods in bulk, \$2.05 has been paid, and up to \$2.15 is now asked. HGH has sold at \$2.15, and \$2.25 is now an inside figure. Higher prices are anticipated as the season advances.

QUININE.—Demand is small, and the market is quiet, with quotations 23c. per oz. for German. Second-hands offer Java at 21c., and German at 22c., but sales have not been large.

SARSAPARILLA.—Mexican is steady at 7½c.

SENEGA is now held at 55c., and likely to go higher, as the crop will probably be small.

WILD CHERRY-BARK.—Prime goods are scarce, and firm. Inferior grades are plentiful, and values range 4c. to 7c. per lb., according to quality.

German Drug-market.

Hamburg, August 12.

Our drug-market does not show much activity at present, business in general being quiet here.

CAMPHOR (REFINED) is unchanged and dull of sale.

CITRIC-ACID remains firm, at 230m. to 235m. per 100 kilos, but the unseasonable weather prevents an improvement in the consumption at present.

CONDURANGO-BARK is dull and lower, at 75m. to 70m. per 100 kilos.

CEVADILLA-SEED is quiet, at 85m. per 100 kilos.

CUMIN-SEED is also quiet, at 48m. per 100 kilos. for Maltese.

CARNAUBA-WAX is unchanged, grey being quoted 105m. per 100 kilos.

ERGOT is quiet and tending lower for forward delivery. Spot is quoted 310m., and forward delivery 260m. per 100 kilos.

JAPANESE WAX is very firm, at 100m. to 102m. per 100 kilos. on the spot.

LYCOPodium is very firm and scarce, at 460m. per 100 kilos. for spot-delivery.

SENEGA is very firm and advancing; little is offered at present.

SERMACEI is quiet, at 220m. per 100 kilos.

WAX (BEES) is quiet; Brazilian yellow is quoted 280m. per 100 kilos.

OILS (FIXED).—Cod-liver is unchanged but firm. Castor dull and neglected. Linseed is quiet. Wood-oil is freely offered.

OILS (ESSENTIAL).—Star-anise is firmer, at 9.95m. per kilo. HGH. Peppermint is firm, at 10m. per lb., but forward offers are higher. Japanese is 8½m. to 9m. per kilo.

Japanese Drug and Chemical Market.

Yokohama, June 29.

The drug-trade continues very quiet, and speculative business is absent, money being short. Transactions are of a hand-to-mouth character. Wholesale druggists decided to oppose the proposed Drug-law Amendment Bill at the general meeting held at Tokyo, but whether they may be able to win against the Government Bill or not is a question to be solved at the next Session of the Diet.

In export articles, menthol crystals are very high now, and holders are not inclined to sell at present quotations, which now stand at 8.60 yen per catty. This is chiefly due to considerably light stock at present, and the rumour that the Japan Menthol Company is winding up has also contributed to the advance. Market is very firm, with still higher tendency, but without important business. Peppermint oil has also advanced considerably for the same reason as menthol and owing to increased demand for the interior market is firmer; present price ranges from 2.50 yen to 2.60 yen per catty. Crude camphor has become a little firmer, 68 yen per picul being quoted. Refined tablets are unchanged at the previous price of 97 yen per 100 lbs. Oil of kuromoji of best quality can be had at 1.60 yen per lb. Galls are selling at 24 yen per picul. Copper sulphate is wanted at 14 yen per case of a picul. Bleaching-powder for export is selling at 5.50 yen per 100 lbs. Iodine of the new crop is now coming in the market, and in consequence makers of iodides have lowered their prices temporarily in order to purchase cheaper raw materials. The present price for iodide of potassium is 3.35 yen per lb., and crude iodine 3.30 yen; iodoform puriss. is 5.50 yen, and resublimed iodine 4.85 yen per lb. for big quantities. During this month some 3,000 lbs. of crude and 1,000 lbs. potass. iodd. and 500 lbs. iodoform were exported from this port for Asiatic ports and Europe.

In import goods, cocaine has dropped considerably, owing to free arrivals, which are estimated by some authoritative people at about 1,300 oz. The present price is 9.00 yen per oz. in tins. Tartaric and citric acids are selling at unchanged prices. Carbolic acid was very weak until a couple of weeks ago, but owing to the outbreak of cholera at Nagasaki and neighbourhood the demand has largely increased, especially on the appearance of the epidemic in the metropolis a few days ago. The price is very likely to advance, but there being a rather heavy stock some weak holders are still selling at the low price of 32 sen per lb. in 112-lb. drums, and 40 sen per lb. in bottles. Condurango is weak at 28 sen per lb. in bags, owing to cheaper advices from Europe. Ipecacuanha is low at 6.25 yen per lb.; santonin is steady at 9.25 yen per lb.; sulphonal is still selling at 2.55 yen per lb. Quinine is low, with a still lower tendency; holders are now anxious to sell. Very low prices have come from Java, and market is very weak. The present prices are 57 sen for sulphate and 85 sen for hydrochloride without purchasers. Thymol crystals are low at 4.10 yen per lb. Caustic soda is cheap, owing to competition between HB and Crescent brands; the market price is 6.90 yen per picul for 62 per cent.

The Effect of the Camphor and Opium Monopolies.

In his annual report on the trade of South Formosa the British Consul states that the creation of the camphor and opium monopolies has deprived the Tainan merchants of nearly 250,000l. annually, and they now only retain their part of the trade in sugar, which in its turn is becoming for them a precarious means of livelihood. They feel the hardship particularly in the case of the camphor trade, which was originated and developed in that district entirely by their capital and enterprise, and for the loss of which they have as yet received no equivalent. The opium monopoly was established in 1897 in order to check, or, at least, control, the habit among the natives. The habit, however, appears to be spreading, the return of licensed smokers in the Tainan district at the end of 1900 showing 67,391, as against 55,112 at the end of 1899. The actual number of smokers is believed to be considerably larger, probably about 20 per cent., as smuggling is extensively carried on, notwithstanding the vigilant watch kept by the Customs authorities. The average daily consumption per head is stated to be 2.1 dr.

